IMPRIMIS

REMOVABLE STORAGE DRIVE

PA3A1
PA3A2

GENERAL DESCRIPTION

OPERATION

INSTALLATION AND CHECKOUT

PARTS DATA

HARDWARE MAINTENANCE MANUAL VOL. 1 83324480

REVISION RECORD

REVISION	DESCRIPTION
01 (04-20-82)	Preliminary Release
02 (10-09-82)	Preliminary manual updated with technical and editorial changes. This edition obsoletes all previous editions.
03 (12-07-82)	Preliminary manual updated with technical changes.
04 (02-03-83)	Preliminary manual updated with technical changes.
A (04-07-83)	Original release. Documents Series Codes 01, 02, 03, and 04 units. This edition obsoletes all previous editions.
B (07-20-83)	Manual revised to incorporate series code 05 technical and editorial changes. This edition obsoletes all previous editions.
C (09-15-83)	Manual revised to incorporate the following series code 06 changes: ECOs DJ03308, DJ03322, DJ03392, DJ03254, technical changes, and editorial changes.
D (11-23-83)	Manual revised to incorporate the following series code 07 changes: ECOs DJ03406, DJ03435, DJ03436, technical changes, and editorial changes.
E (04-06-84)	Manual revised to incorporate the following series code 08 changes: ECOs DJ03407, DJ03462, DJ03478, DJ03504, DJ03533, technical changes, and editorial changes. This edition obsoletes all previous editions.

REVISION LETTERS I, O, Q AND X ARE NOT USED.

By Imprimis Technology Incorporated
Technical Publications Department
5950 Clearwater Drive
Minnetonka, MN 55343

We value your comments. A Comment Sheet is provided at the back of this manual.

Printed in the United States of America

REVISION RECORD (Contd)

REVISION	DESCRIPTION
F (06-15-84)	Manual revised to incorporate the following series code 09 changes: ECOs DJ03465, DJ03560, DJ03574, technical changes, and editorial changes. This edition obsoletes all previous editions.
G (08-20-84)	Manual revised to incorporate the following series code 10 changes: ECOs DJ03518, DJ03602, technical changes, and editorial changes.
H (02-18-85)	Manual revised to incorporate the following series codes 11 thru 14 changes: class 1 ECOs DJ03755, DJ03750, DJ03741, DJ03727, DJ03659, DJ03657, DJ03550, class 2 ECOs DJ08208, DJ03795, DJ03779, DJ03752, DJ03746, DJ03740, DJ03724, DJ03715, DJ03701, DJ03700, DJ03694, DJ03672, DJ03663, DJ03658, technical and editorial changes.
J (12-12-85)	Manual revised to incorporate the following series codes 15 thru 20 changes: class 1 ECOs DJ03769, DJ03797, DJ03811, DJ03851, DJ03867, DJ03882, DJ03908, DJ03922, DJ28003, class 2 ECOs DJ03798, DJ03810, DJ03814, DJ03821, DJ03822, DJ03833, DJ03857, DJ03872, DJ03873, DJ03884, DJ03887, DJ03898, DJ03899, DJ03905, DJ03916, DJ03920, DJ28036, DJ30207, DJ30249, technical changes, and editorial changes. This edition obsoletes all previous editions.
K (05-30-86)	Incorporated the following series codes 19 and 20 changes: class 1 ECOs DJ03881, DJ03935, class 2 ECOs DJ03909, DJ03925, DJ03946, DJ03948, DJ03951, DJ30334, technical changes, and editorial changes.
L (09-12-86)	Incorporated the following series code 21 changes: class 1 ECOs DJ03964, DJ03971, class 2 ECOs DJ03947, DJ03970, technical changes, and editorial changes.
M (04-01-87)	Incorporated the following series code 22 changes: class 1 ECOs DJ03998, DJ35000, class 2 ECOs DJ03974, DJ03978, DJ03987, DJ35010, technical changes, and editorial changes.
N (09-20-88)	Incorporated the following series codes 23 and 24 changes: ECOs DJ03996, DJ35028, DJ35042, DJ35056, DJ35057, DJ35086, technical changes, and editorial changes.

REVISION RECORD (Contd)

REVISION	DESCRIPTION
P (04-26-89)	Incorporated the following series code 24 changes: ECO DJ35113, DJ35120, technical changes, and editorial changes.

MANUAL TO EQUIPMENT LEVEL CORRELATION

This manual reflects the equipment configurations listed below.

EXPLANATION: Locate the equipment type and series code number, as shown on the Equipment Configuration Log, in the list below. Immediately to the right of the series code number is an FCO number. If that number and all of the numbers underneath it match all of the numbers on the Equipment Configuration Log, then this manual accurately reflects the equipment.

This correlation sheet also applies to the following related manuals:

Pub. No. 83324490 Rev. K
Pub. No. 83324630 Rev. M

EQUIPMENT TYPE	SERIES CODE	WITH FCOs	COMMENTS
PA3A1/PA3A2	01	None	
	02	None	
	03	None	
	04	None	
	05	None	
	06	None	
	07	None	
	08	None	
	09	None	
	10	None	
	11	None	
	12	None	
	13	None	
	14	None	
	15	None	
	16	None	
	17	None	
	18	None	
	19	None	
	20	None	
	21	None	
	22	None	
	23	None	
	24	None	

LIST OF EFFECTIVE PAGES

This manual is at revision P. Each page in your manual should be at the revision level listed below. The "Div" is a colored divider page.

PAGE/REV		PAGE/REV		PAGE/REV		PAGE/REV		PAGE/REV	
Cover	-	Blank	-	3-23	M	4-12	J	4-53	N
Warnings	-	2-1	N	3-24	M	4-13	J	4-54	N
Title P	-	2-2	N	3-25	M	4-14	M	4-55	N
f-2	P	2-3	N	3-26	M	4-15	M	4-56	N
f-3	P	2-4	N	3-27	M	4-16	J	4-57	P
f-4	P	2-5	N	3-28	M	4-17	J	4-58	P
f-5	P	2-6	N	3-29	M	4-18	J	4-59	P
Blank	-	2-7	N	3-30	M	4-19	P	4-60	P
f-7	P	2-8	N	3-31	M	4-20	N	4-61	N
Blank	-	2-9	P	3-32	M	4-21	N	Blank	-
f-9	P	2-10	J	3-33	N	4-22	K	App A	-
f-10	P	2-11	N	3-34	N	4-23	N	Blank	-
f-11	N	2-12	L	3-35	N	4-24	N	A-1	P
f-12	N	2-13	J	3-36	N	4-25	N	A-2	P
f-13	N	2-14	J	3-37	N	4-26	N	A-3	N
f-14	N	2-15	J	3-38	N	4-27	N	A-4	N
f-15	N	Blank	-	3-39	N	4-28	N	A-5	N
Blank	-	S-3 Div	-	3-40	N	4-29	N	A-6	N
f-17	P	Blank	-	3-41	N	4-30	J	App B	-
f-18	P	3-1	H	3-42	N	4-31	L	Blank	-
f-19	N	3-2	N	3-43	N	4-32	K	B-1	P
Blank	-	3-3	H	3-44	N	4-33	K	B-2	P
f-21	N	3-4	J	3-45	N	4-34	J	B-3	N
Blank	-	3-5	P	3-46	N	4-35	K	B-4	N
f-23	P	3-6	N	3-47	N	4-36	J	B-5	N
f-24	N	3-7	P	3-48	N	4-37	P	B-6	N
f-25	P	3-8	M	3-49	N	4-38	M	App C	-
f-26	N	3-9	P	3-50	N	4-39	N	Blank	-
S-1 Div	-	3-10	M	S-4 Div	-	4-40	M	C-1	P
Blank	-	3-11	P	Blank	-	4-41	M	C-2	P
1-1	P	3-12	M	4-1	P	4-42	L	C-3	N
1-2	M	3-13	M	Blank	-	4-43	P	C-4	N
1-3	M	3-14	M	4-3	P	4-44	J	C-5	N
1-4	F	3-15	N	4-4	J	4-45	J	C-6	N
1-5	G	3-16	P	4-5	J	4-46	J	Cmt Sht	-
1-6	G	3-17	M	4-6	N	4-47	L	Rtn Env	-
1-7	E	3-18	M	4-7	N	4-48	L	Blank	-
1-8	G	3-19	M	4-8	N	4-49	N	Cover	-
1-9	A	3-20	M	4-9	N	4-50	N		
1-10	H	3-21	M	4-10	N	4-51	N		
S-2 Div	-	3-22	M	4-11	N	4-52	N		

PREFACE

This manual contains maintenance information for the Imprimis PA3A1 and PA3A2 Removable Storage Drives (RSDs). It provides instructions to all personnel who operate the RSD and to customer engineers who install and check out the RSD. Customer engineers who troubleshoot and repair RSDs should obtain copies of the hardware maintenance manual, volumes 2 and 3 (listed below) that pertain to the drives they are maintaining.

Changes to this manual are indicated in the following ways:

- A vertical bar in the outer margin of a page marks a changed area.
- A dot by the page number indicates the entire page contains new or changed information.
- A vertical bar by the page number indicates the information was moved from another page, but there were no technical or editorial changes.

The information in this manual is presented as follows:

Section 1 - General Description. Describes equipment functions and specifications.
Section 2 - Operation. Describes and illustrates the location and use of all controls and indicators, and provides operating procedures.
Section 3 - Installation and Checkout. Describes site requirements, unpackaging and inspection, installation and checkout.
Section 4 - Parts Data. Contains illustrated parts breakdown and spare parts list.

The following manuals apply to the RSD and are available from:

Imprimis Technology Incorporated
Customer Services
5950 Clearwater Drive
Minnetonka, MN 55343

Phone: (612) 931-8612
Fax: (612) 931-8817

Publication No.	Title
83324480	PA3A1/PA3A2 Hardware Maintenance Manual, Volume 1
83324490	PA3A1/PA3A2 Hardware Maintenance Manual, Volume 2 (contains theory of operation and maintenance)
83324630	PA3A1/PA3A2 Hardware Maintenance Manual, Volume 3 (contains diagrams)
83324660	A Guide for the Disk Drive Operator
83325360	Reference Card (provides status code and diagnostics information)

CONTENTS

FIGURES

TABLES

IMPORTANT SAFETY INFORMATION AND PRECAUTIONS

Use of proper safety and repair techniques is important for safe, reliable operation of this unit. Service should be done only by qualified persons. We recommend the procedures in this manual as effective ways of servicing the unit. Some procedures require the use of special tools. For proper maintenance and safety, you must use these tools as recommended.

The procedures in this manual and labels on the unit contain warnings and cautions that must be carefully read and followed to minimize or eliminate the risk of personal injury. The warnings point out conditions or practices that may endanger you or others. The cautions point out conditions or practices that may damage the unit, possibly making it unsafe for use.

You must also understand that these warnings and cautions are not exhaustive. We cannot possibly know, evaluate, and advise you of all the ways in which maintenance might be performed or the possible risk of each technique. Consequently, we have not completed any such broad evaluation. If you use a non-approved procedure or tool, first ensure that the method you choose will not risk either your safety or unit performance.

For the safety of yourself and others, observe the following warnings and precautions.

- Perform all maintenance by following the procedures in this manual.
- Follow all cautions and warnings in the procedures and on unit labels.
- Use the special tools called out in the procedures.
- Use sound safety practices when operating or repairing the unit.
- Use caution when troubleshooting a unit that has voltages present. Remove power from unit before servicing or replacing parts.
- Wear safety glasses when servicing units.
- Wear safety shoes when removing or replacing heavy parts.
- Use only designated Imprimis replacement parts. Non-Imprimis replacement parts can adversely affect safety in addition to degrading reliability, increasing maintenance downtime, and voiding warranty coverage.

- Use care while working with the power supply because line voltages are always present when the ac power cord is connected to a power source. For complete safety, remove the ac power plug from the site power outlet.

- In case of fire or other emergency, isolate the drive from main power by removing the drive power plug from the ac outlet. In situations where pulling the plug is not possible or practical, use the system main power disconnect to isolate the drives from main power.

- When the drive is mounted in an equipment rack or cabinet, ensure that the internal temperature of the rack or cabinet will not exceed the limits defined for the drive. Where units are stacked vertically, pay special attention to the top where temperatures are usually highest.

- This drive is designed to be installed and operated in accordance with IEC380, IEC435, VDE805, VDE806.

- Follow the precautions listed under Electrostatic Discharge Protection in section 3 of this manual.

- If the power supply is placed on a bench for testing, position the supply so all ventilation holes are open, to allow proper air flow to internal components.

- Do not operate the drive over an extended period of time without the top cover installed.

- If the drive uses a recommended Imprimis power supply and gets power from a network that doesn't have a direct connection to earth ground (IT network), limit the power supply input voltage as follows:

  - For power supply part numbers 81542300 through 81542302 or 72896500 through 72896503, limit the input to 230 V ac.

  - For other recommended Imprimis power supplies, limit the input to 240 V ac.

- Always deenergize drive before removing or installing circuit boards, cables, or any other electrical components.

- If you do not use a recommended Imprimis power supply, ensure that the supply meets the specifications in this manual and is designed to be used in accordance with IEC380, IEC435, VDE805, VDE806.

- Keep hands away from actuator during seek operations. Under certain conditions, emergency retract voltage may be present, causing sudden reverse motion and head unloading.

- Use caution while working near heads. Do not touch the head pads under any circumstances. If contact is made with the head pad, head must be replaced. Heads cannot be cleaned in the field.

- Keep all watches, disk packs, meters, and other test equipment away from magnet area.

- Do not use customer data packs for testing purposes. See paragraph on disk packs.

- Do not use the CE alignment pack unless specifically directed to do so. These packs contain prerecorded alignment data that can be destroyed if test procedures require the drive to write. The CE alignment pack cannot be generated in the field.

- Keep all metal tools away from flex leads while power is applied in order to prevent damage to the power amplifier.

- If power to voice coil is lost and heads fail to retract, swing read/write boards up to maintenance position, remove top air (head access) cover and carefully pull carriage back to the retract position.

- Do not attempt to open front door when the heads are extended into the disk pack area or damage to heads will result. See paragraph on Overriding Front Door Interlock.

- Always remove the data pack when the drive is moved from one location to another. Failure to do so could cause damage to heads and data pack.

CONFIGURATION CHART

EQUIPMENT NUMBER	INTERFACE	DATA CAPACITY (MB)	POWER SUPPLY
PA3A1A	Single Channel	80	Remote
PA3A1B	Single Channel	80	Remote
PA3A1C	Single Channel	80	Integral
PA3A1D	Single Channel	80	Integral
PA3A1E	Single Channel	80	Remote
PA3A1J	Single Channel	80	Integral
PA3A1K	Single Channel	80	Integral
PA3A1L	Single Channel	80	Integral
PA3A1M	Single Channel	80	Integral
PA3A1N	Single Channel	80	Integral
PA3A1P	Single Channel	80	Integral
PA3A2A	Dual Channel	80	Remote
PA3A2B	Dual Channel	80	Integral
PA3A2C	Dual Channel	80	Integral
PA3A2D	Dual Channel	80	Integral
PA3A2E	Dual Channel	80	Remote
PA3A2G	Dual Channel	80	Remote

ABBREVIATIONS

A	Ampere
ABV	Above
ac	Alternating Current
ADD	Address
ADDR	Address
ADJ	Adjust
ADRS	Address
AGC	Automatic Gain Control
ALT	Alternate
AM	Address Mark
AME	Address Mark Enable
AMP	Amplifier, Ampere
ASSY	Assembly
BLW	Below
C	Celsius
CB	Circuit Breaker
CDA	Complete Drive Assembly
CH	Channel
CHK	Check
CLK	Clock
CLR	Clear
cm	Centimeter
CNTR	Counter
COMP	Comparator
CONT	Control
CONTD	Continued
CT	Center Tap
CYL	Cylinder
D/A	Digital to Analog
dc	Direct Current
DET	Detect
DIFF	Differential
DIV	Division
DLY	Delay
DRVR	Driver
ECL	Emitter Coupled Logic
ECO	Engineering Change Order
EN	Enable
ENBL	Enable

ABBREVIATIONS (Contd)

EXT	External
F	Fahrenheit, Fuse
FCO	Field Change Order
FDBK	Feedback
FIG	Figure
FLT	Fault
FRU	Field Replaceable Unit
FSD	Fixed Storage Drive
ft	Foot
FTU	Field Test Unit
FWD	Forward
GND	Ground
HD	Head
HEX	Hexagon
Hg	Mercury
HR	High Resolution
HYST	Hysteresis
Hz	Hertz
IC	Integrated Circuit
IDENT	Identification
in	Inch
IND	Index
INTRPT	Interrupt
I/O	Input/Output
IPB	Illustrated Parts Breakdown
IPS	Inches per Second
kg	Kilogram
kPa	Kilopascal
kW	Kilowatt
lb	Pound
lbf	Pounds-Force
LED	Light Emitting Diode
LSI	Large Scale Integration
LTD	Lock to Data
m	Meter
MAX	Maximum
MB	Megabyte
MEM	Memory
MHz	Megahertz

ABBREVIATIONS (Contd)

mm	Millimeter
MPU	Microprocessor Unit
MRK	Mark
ms	Millisecond
MTR	Motor
mV	Millivolt
N	Newton
NC	No Connection
NORM	Normal
NRZ	Non Return to Zero
ns	Nanosecond
OC	On Cylinder
OS	One-Shot
OSC	Oscillator
P	Plug
PD	Peak Detect
pF	Picofarad
PG	Page
PHH	Phillips Head
PLO	Phase Lock Oscillator
P/N	Part Number
PROC	Procedure
PROG	Programmable
PS	Power Supply
PWR	Power Supply
RCVR	Receiver
RD	Read
RDY	Ready
REF	Reference
REQ	Request
RES	Resolution
REV	Reverse, Revision
RGTR	Register
r/min	Revolutions Per Minute
RSD	Removable Storage Drive
RTZ	Return to Zero
R/W	Read/Write
s	Second
S/C	Series Code
SEC	Second
SEL	Select
SEQ	Sequence
SPD	Speed

ABBREVIATIONS (Contd)

SS	Sector Switch	W	Watts
T	Tracks to go	W/	With
TF	Thread Forming	W/O	Without
TIM	Timer	W PROT	Write Protect
TP	Test Point	W+R	Write or Read
TSP	Troubleshooting Procedure	W·R	Write and Read
TTL	Transistor-Transistor Logic	WRT	Write
V	Volts, Voltage	XFR	Transfer
Vbb	Bias Voltage	Ω	Ohms
VCC	Bias Voltage	$	Hexadecimal Address
VCO	Voltage Controlled Oscillator	µF	Microfarad
		µs	Microsecond

SECTION 1

GENERAL DESCRIPTION

GENERAL DESCRIPTION 1

INTRODUCTION

The Imprimis PA3A1/PA3A2 Removable Storage Drives (RSDs) are high speed, random access digital data storage devices that connect to a central processor through a controller. The total data storage capacity of the drive is 80 megabytes. All the equipment specifications for the drives are listed in table 1-1.

The remainder of this section provides a general description of the drives and is divided into the following areas:

- Data Storage Medium -- Describes the data pack which is the medium used to store the data.
- Equipment Functional Description -- Explains the basic function of the drive.
- Equipment Physical Description -- Provides a basic description of the drive's physical characteristics.
- Equipment Configuration -- Describes the various drive configurations and how to identify them.

DATA STORAGE MEDIUM

The data storage medium for the drive is a data pack, consisting of three disks, center-mounted on a hub and housed in a sealed plastic case (see figure 1-1). When installed in the drive, two ports open automatically to allow the heads to enter and clean air to circulate through the data pack. The data pack is portable and interchangeable between drives.

The disk pack has a total of six usable surfaces, each coated with a layer of magnetic oxide and related binders and adhesives. One of these surfaces, referred to as the servo surface, contains information prerecorded at the factory. This surface is used by the drive to generate position information and various timing signals. The remaining five surfaces can be used by the system for data storage and are referred to as data surfaces.

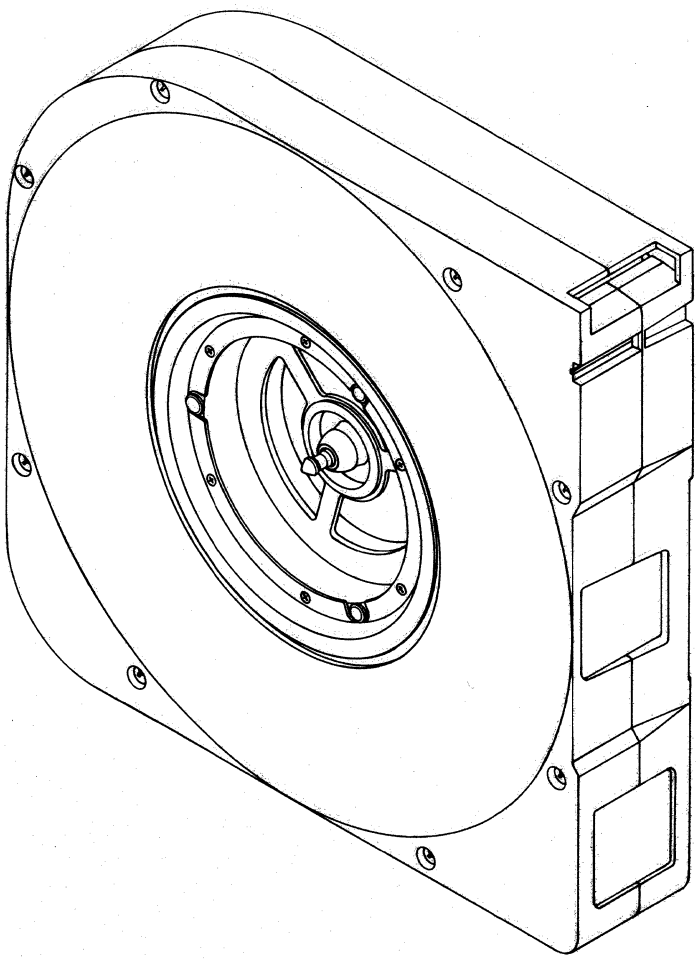
Refer to the operation section of this manual for information about data pack handling.

TABLE 1-1. DRIVE SPECIFICATIONS

Characteristics	Conditions	Specifications
PHYSICAL		
Size	Dimensions	See Space Requirements in section 3
	Weight (Drive Only)	27.2 kg (60.0 lb)
	Weight (Power Supply Only)	5.4 kg (12.0 lb)
Recording	Total Capacity (Unformatted)	80 megabytes
	Bytes per track	20 160 bytes
	Number of disks	3
	Movable data heads	5
	Servo Heads	1
	Tracks per inch	543
	Physical heads per surface	1
	Logical cylinders per head/disk assy	823 (0-822)
Table Continued on Next Page		

TABLE 1-1. DRIVE SPECIFICATIONS (Contd)

Characteristics	Conditions	Specifications
PERFORMANCE		
Transfer rate	Disk speed at 3600 r/min	9.677 MHz (1.2 megabytes/sec)
Latency		Latency is time to reach a particular track address after positioning is complete.
	Average	8.33 milliseconds (disk rotation speed at 3600 r/min)
	Maximum	16.83 milliseconds (disk rotation speed at 3564 r/min)
Recording	Mode	2-7 code
	Density	9994 bits per inch (inner track)
Seek Time	Full	55 milliseconds maximum
	Average	30 milliseconds
	Single Track	7 milliseconds maximum
Start Time		60 seconds typical 70 seconds maximum
Stop Time	START switch off	25 seconds typical 35 seconds maximum
	Power loss	90 seconds typical



10R3A

Figure 1-1. Drive Data Pack

EQUIPMENT FUNCTIONAL DESCRIPTION

The drive contains all the circuits and mechanical devices necessary to record data on and recover it from the disks in the data pack. The necessary power for this is provided by the power supply, which receives its input power from the site main power source. The power supply is shipped as an option with the drive.

All functions performed by the drive are done under direction of the controller. The controller communicates with the drive via the interface which consists of a number of I/O lines carrying the necessary signals to and from the drive.

Some interface lines, including those that carry commands to the drive, are not enabled unless the drive is selected by the controller. Unit selection allows the controller, which can be connected to more than one drive, to initiate and direct an operation on a specific unit.

All operations performed by the drive are related to data storage and recovery (normally referred to as writing and reading). The actual reading and writing is performed by electromagnetic devices called heads that are positioned over the recording surfaces of the rotating data pack disks. There is a separate head for each disk surface in the data pack, and the heads are positioned in such a way that data is written in concentric tracks around the disk surfaces (see figure 1-2).

Before any read or write operation can be performed, the controller must instruct the drive to position the heads over the desired track (called seeking) and also to use the head located over the surface (head selection) where the operation is to be performed.

After selecting a head and arriving at the data track, the controller still must locate that portion of the track on which the data is to be written or read. This is called track orientation and is done by using the Index and Sector signals generated by the drive. The Index signal indicates the logical beginning of each track, and the Sector signals are used by the controller to determine the position of the head on the track with respect to Index.

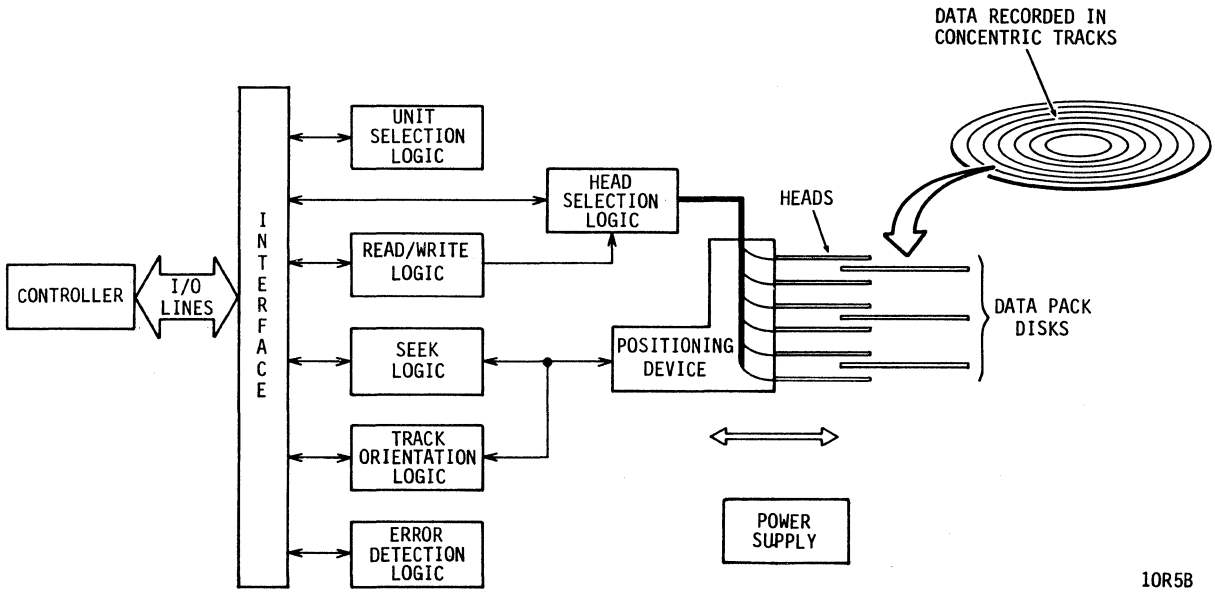


Figure 1-2. Drive Functional Block Diagram

When the desired location is reached, the controller commands the drive to actually read or write the data. During a read operation, the drive recovers data from the data pack, and transmits it to the controller. During a write operation, the drive receives data from the controller, processes it and writes it on the data pack.

The drive is also capable of recognizing certain errors that may occur during its operation. When an error is detected, it is indicated either by a signal to the controller or by a maintenance indicator on the drive itself.

EQUIPMENT PHYSICAL DESCRIPTION

The following paragraphs provide a physical description of the drive. The components mentioned in this discussion are identified in figure 1-3.

An installation requires a drive, interconnecting cabling, and a power supply. Site power enters the power supply via the ac power cable. The power supply develops the dc voltages required by the drive. These voltages are supplied to the drive by the dc harness.

The drive package includes a deck, front and rear panels, and a top cover. Air flow is provided by a fan, mounted on the rear panel, to circulate cooling air around the electronic assemblies. This air enters a port in the front panel, passes through an air filter, and exhausts through the rear panel opening.

The drive front panel contains the operator controls and the front door. The operator controls consist of the logic plug and all switches and indicators used by the operator to control normal operation of the drive. The front door can be opened when the door unlock solenoid is energized to permit installation of a data pack into the pack receiver.

Closing the front door engages the data pack hub to the spindle so that the drive motor can rotate the data pack disks. In this position, the data pack is part of a closed-loop circulation of clean air. This air circulation, driven by an impeller on the drive motor, passes through an absolute filter and follows a closed path past the actuator and through the data pack to purge air impurities from the pack.

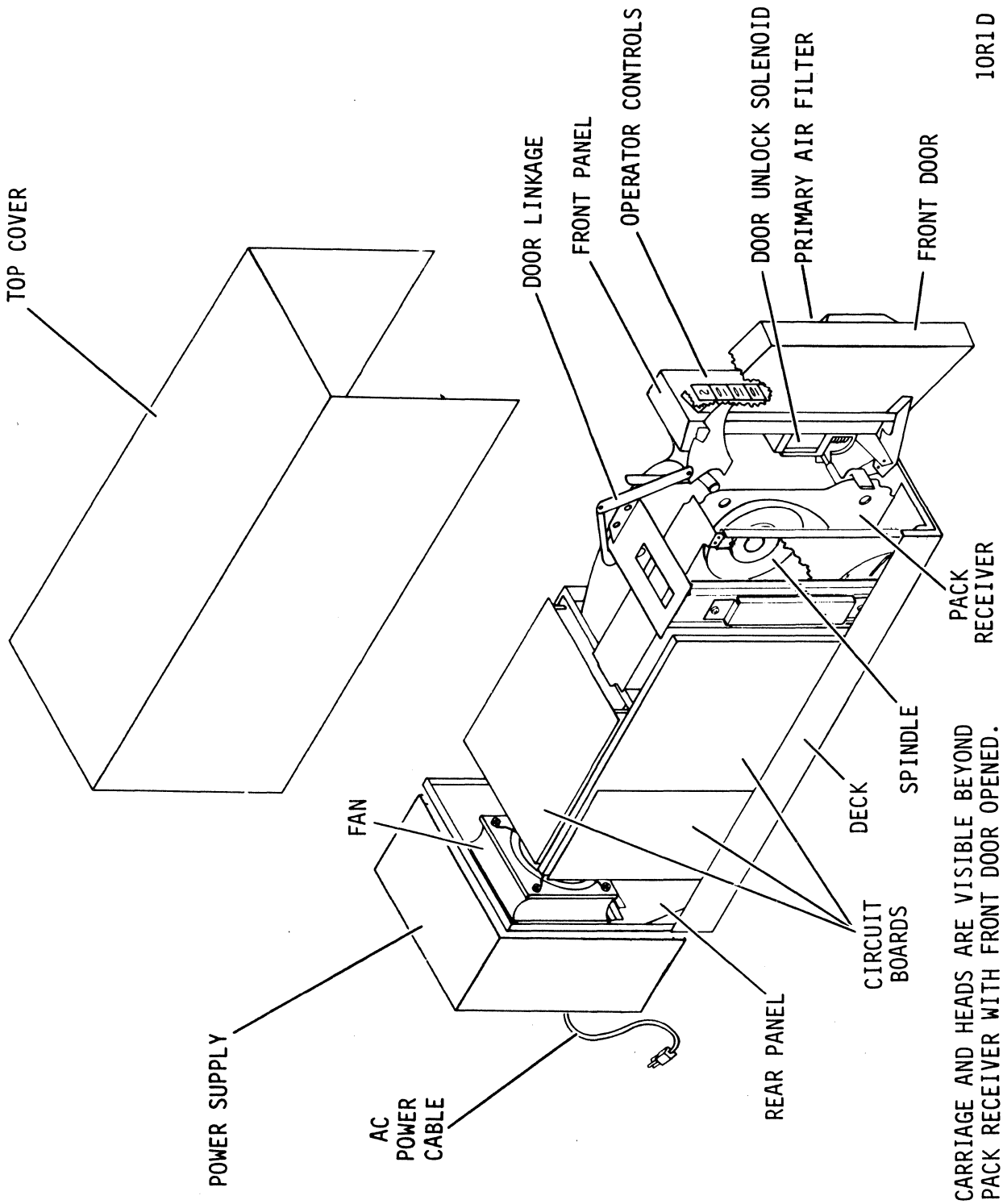


Figure 1-3. Drive Major Assemblies

The actuator, which is located behind the pack receiver, positions the heads over the disk surfaces in the data pack. The actuator has a voice coil which moves in and out of a permanent magnetic field in response to signals from the servo positioning circuitry. The voice coil forces the actuator carriage to slide on parallel rails to move the heads accurately across the disk surfaces. There are six heads, a servo head to control actuator positioning and five data heads used for data transfers to and from the disks.

In addition, the drive has interconnected circuit boards that contain the electronics required for drive operation.

A complete listing of field-replaceable parts is given in the parts data section of this manual. Refer to volume 2 of the hardware maintenance manual for theory of operation of the drive components.

EQUIPMENT CONFIGURATION

GENERAL

The equipment configuration is identified by the equipment identification label and by the Equipment Configuration Log. It is necessary to identify the equipment configuration to determine if the manuals being used are applicable to the equipment. The following describes the equipment identification label, Equipment Configuration Log, and Manual To Equipment Correlation sheet.

EQUIPMENT IDENTIFICATION

General

The equipment is identified by labels attached to the drive and to the power supply. The label on the drive identifies the basic mechanical and logical configuration of the drive at the time it leaves the factory. The label on the power supply references the components making up the drive installation and lists the site power requirements for the power supply. The information contained on these labels is defined in the following paragraphs.

Equipment Identification Number

The equipment identification number is divided into the two parts shown in the example:

EXAMPLE:

The equipment identifier indicates the basic functional capabilities of the drive.

The type identifier indicates differences between drives that have the same equipment identifier. These differences are necessary to adapt a drive to specific system requirements. However, they do not change the overall capabilities of the drive as defined in table 1-1.

The standard drive has single channel access. An option is available that gives the drive dual channel access. Single channel drives can connect to and communicate with one controller. Dual channel drives can connect to and communicate with two controllers.

Series Code

The series code represents a time period within which a unit is built. All units are interchangeable at the system level, regardless of series code; however, parts differences may exist within units built in different series codes. When a parts difference exists, that difference is noted in the parts data section of this manual.

Part Number

The equipment identification label on the power supply lists three numbers: the equipment package part number, the CDA number, and the power supply number. The equipment package part number specifies the complete list of parts shipped with the drive, including the drive, power supply, colored panels, and mounting hardware. The CDA (Complete Drive Assembly) number is the part number for the drive only. The power supply number is the part number for the power supply only.

Serial Number

Each drive has a unique serial number assigned to it. Serial numbers are assigned sequentially within a family of drives. Therefore, no two equipments will have the same serial number.

EQUIPMENT CONFIGURATION LOG

Engineering Change Orders (ECOs) are electrical or mechanical changes that are performed at the factory and may cause a series code change. When the factory installs an ECO early (prior to a series code change), it is logged on the Equipment Configuration Log.

Field Change Orders (FCOs) are electrical or mechanical changes that may be performed either at the factory or in the field. FCO changes do not affect the series code but are indicated by an entry on the Equipment Configuration Log that accompanies each machine. The components of a machine with an FCO installed may not be interchangeable with those of a machine without the FCO; therefore, it is important that the Equipment Configuration Log be kept current by the person installing the FCO.

MANUAL TO EQUIPMENT LEVEL CORRELATION

Throughout the life cycle of a machine, changes are made, either in the factory build (a series code change) or by FCOs installed in the field. All of these changes are also reflected in changes to the manual package. In order to assure that the manual correlates with the machine, refer to the Manual To Equipment Level Correlation sheet located in the front matter of this manual. This sheet records all the FCOs which are reflected in the manual. It should correlate with the machine FCO log if all the FCOs have also been installed in the machine.

SECTION 2

OPERATION

OPERATION 2

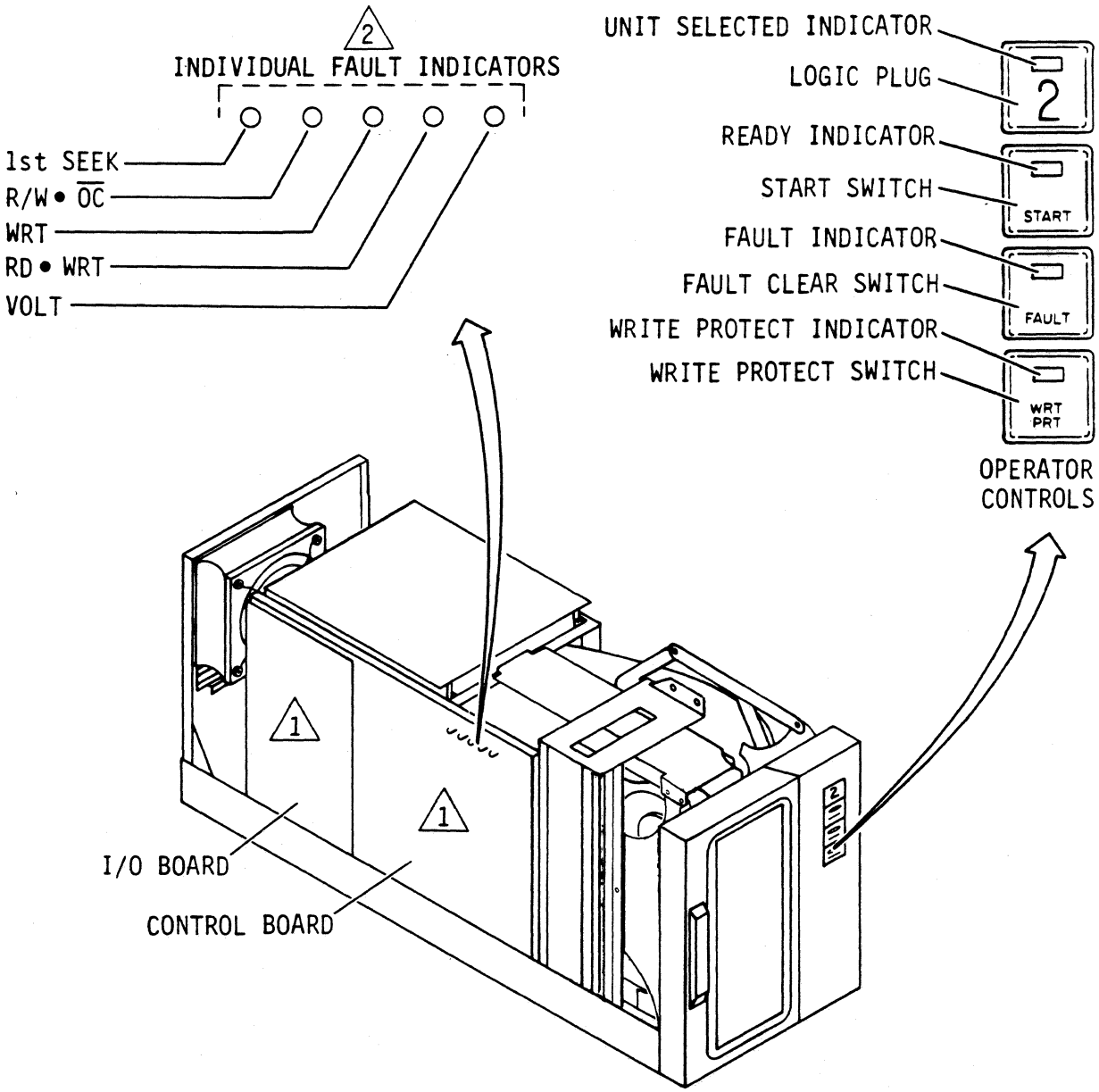
INTRODUCTION

This section provides the information and instructions to operate the drive. It is arranged as follows:

- Switches and Indicators -- locates and describes the switches and indicators used for normal drive operation.
- Operating Instructions -- describes procedures for operating the drive.
- Filter Replacement and Cleaning -- describes filter maintenance for the drive operator.

SWITCHES AND INDICATORS

Switches and indicators used by the operator are on the power supply, on the drive operator panel, and on the control board. Figure 2-1 shows these switches and indicators, and they are described in table 2-1. Refer to section 3 for information on switches that are not normally used by the drive operator.

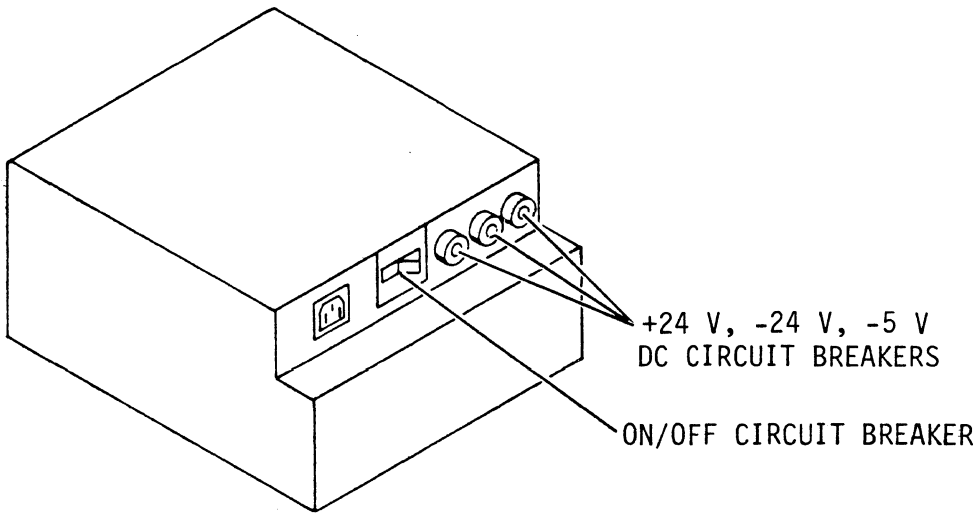


NOTES:

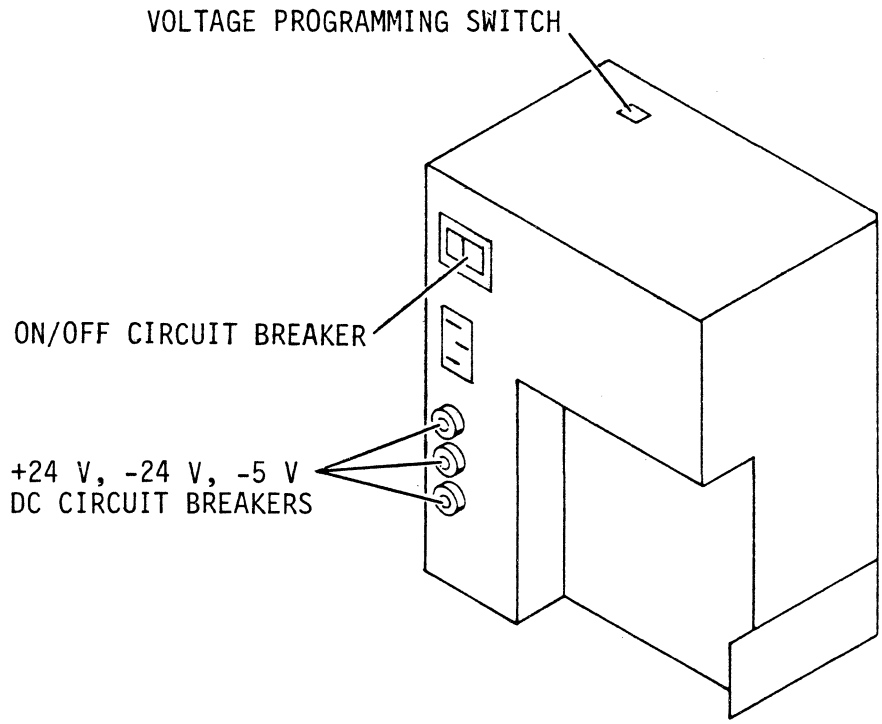
1. SWITCHES LOCATED ON CIRCUIT BOARDS ARE ILLUSTRATED IN SECTION 3
2. INDIVIDUAL FAULT INDICATORS ARE VISIBLE THROUGH OPENINGS ON TOP COVER

10R64F

Figure 2-1. Switches and Indicators (Sheet 1 of 3)



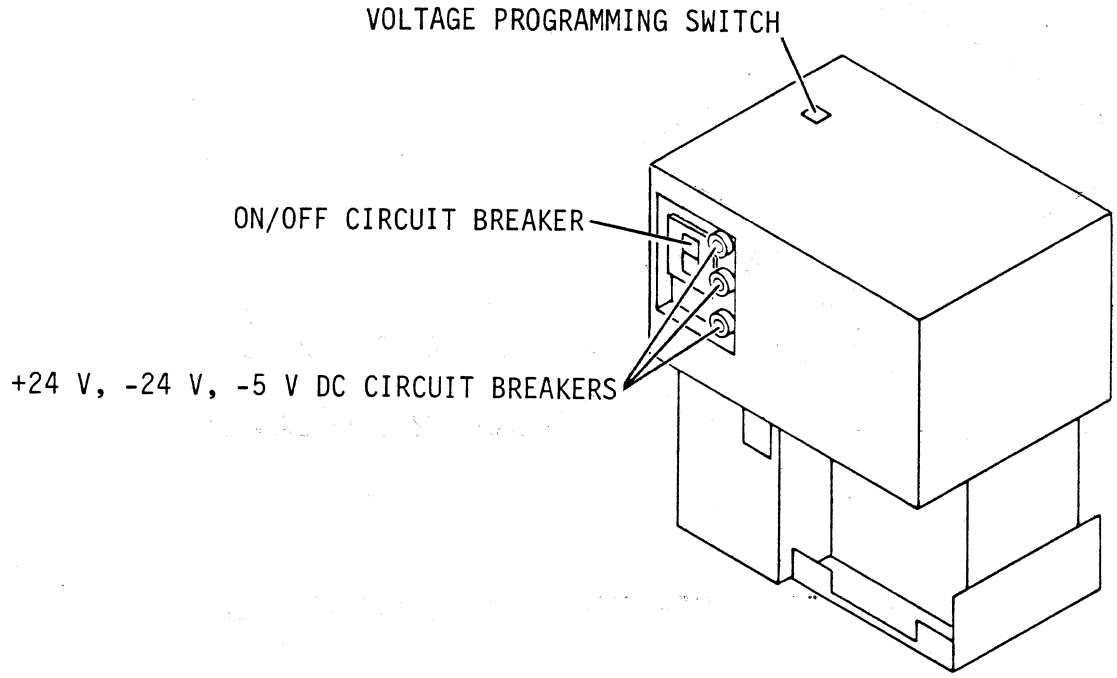
REMOTE POWER SUPPLY (P/N 728965XX)



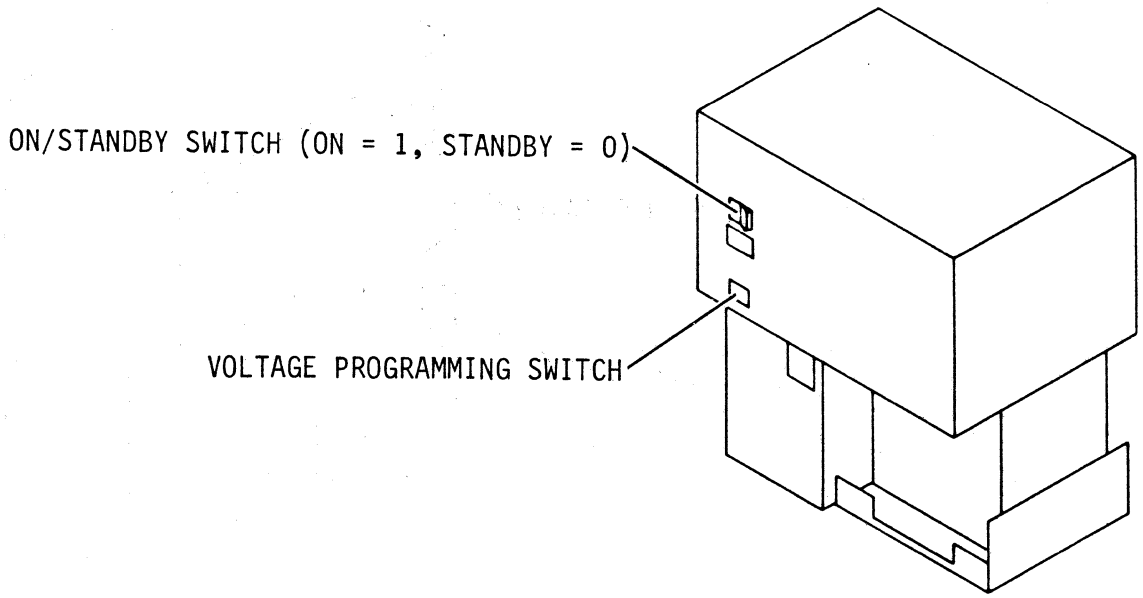
INTEGRAL POWER SUPPLY (P/N 81542300)

11D636

Figure 2-1. Switches and Indicators (Sheet 2)



INTEGRAL POWER SUPPLY (P/N 81542301/02/03)



INTEGRAL POWER SUPPLY (P/N 81542304)

11D637

Figure 2-1. Switches and Indicators (Sheet 3)

TABLE 2-1. DRIVE SWITCHES AND INDICATORS

Switch or Indicator	Function
POWER SUPPLY	
ON (1)/STANDBY (0) Switch (on newer integral supplies) and ON/OFF Circuit Breaker (on other supplies)	Applies dc operating voltages to the drive electronics and fan.
-24 V Circuit Breaker*	Protects the -24 V supply. To reset circuit breaker, press in pop-out element.
+24 V Circuit Breaker*	Protects the +24 V supply. To reset circuit breaker, press in pop-out element.
-5 V Circuit Breaker*	Protects the -5 V supply. To reset circuit breaker, press in pop-out element.
	The +5 and +40 V supplies are protected by current-limiting circuitry in the power supply.
Voltage Programming Switch	Refer to Power Supply Voltage Conversion procedure in section 3.
OPERATOR PANEL	
Logic Plug/Unit Selected Indicator	The logic plug activates switches that establish the logical address of the device. Logic plugs are available with numbers 0 through 15. The Unit Selected indicator is lit if drive is selected.

*Not found on all power supplies. Newer power supplies are internally protected.

Table Continued on Next Page

TABLE 2-1. DRIVE SWITCHES AND INDICATORS (Contd)

Switch or Indicator	Function
OPERATOR PANEL (Contd)	
START Switch/ Ready Indicator	The START switch has alternate action, in for Start and out for Stop, and it contains the Ready indicator. Pressing the START switch to the Start position enables the power on sequence. The Ready indicator flashes until the disks are up to speed, the heads are loaded, and there are no fault conditions. The Ready indicator is on steadily with power on complete. Pressing the START switch to release it from the Start position causes the Ready indicator to flash until disk rotation has stopped.
FAULT Indicator/ Fault Clear Switch	The FAULT indicator is inside the Fault Clear switch and lights if certain faults exist within the drive. It is turned off by any of the following (provided that the fault condition(s) no longer exist): • Pressing the Fault Clear switch • Fault Clear command from the controller • Reapplying power to the drive
WRT PRT Switch/Indicator	The operation of the WRT PRT switch, the write protect tab on the data pack, or the W PROT switch on the control board places the drive in the write protected mode (preventing write operations) and lights the WRT PRT indicator.
Table Continued on Next Page	

TABLE 2-1. DRIVE SWITCHES AND INDICATORS (Contd)

Switch or Indicator	Function
CONTROL BOARD	
W PROT/NORM (Write Protect) Switch	Placing the switch in the W PROT position prevents the drive from performing write operations. The switch must be returned to the NORM position to enable write operations.
1st SEEK Indicator	Indicates drive failed first seek/load attempt.
R/W·$\overline{OC}$ Indicator	Indicates write or read conditions existed during a seek operation (an off cylinder condition).
WRT Indicator	Indicates that a write fault has occurred.
RD·WRT Indicator	Indicates that a write and a read command had existed simultaneously.
VOLT Indicator	Indicates a below normal voltage existed.

OPERATING INSTRUCTIONS

Operating instructions are presented in the following sequence:

- Power On Procedure
- Power Off Procedure
- Data Pack Handling and Storage
- Data Pack Installation
- Data Pack Removal
- Data Pack Write Protection

POWER ON PROCEDURE

This procedure describes how to turn on the drive. It is assumed that dc power is supplied to the drive because power supply switch/circuit breaker is normally left in the ON position.

1. Ensure that a data pack is installed and that front door is closed. Drive will not operate unless both conditions are met. Refer to Data Pack Installation procedure given later in this section.

2. Press START switch to engage it in Start position.

    - If the Local/Remote switch on the I/O board was set in the Local position, the power on sequence begins immediately.

    - If the Local/Remote switch was set in the Remote position, the power on sequence begins when power sequence ground is available from the controller.

3. Observe that Ready indicator (located in START switch) flashes, indicating that power on is in progress.

4. Observe that Ready indicator lights steadily within 60 seconds, indicating that disks are up to speed and heads are loaded.

5. Ensure that FAULT indicator is off.

The power on sequence is now complete, and the drive is ready to receive commands from the controller.

POWER OFF PROCEDURE

This procedure describes how to turn off the drive.

1. Press START switch to release it from Start position.

2. Observe that Ready indicator (located in START switch) flashes, indicating that power off is in progress.

3. Observe that Ready indicator goes off within 35 seconds, indicating that power off is complete.

With power off complete, the heads are unloaded and the disks are not rotating. If desired, the data pack can be removed (refer to Data Pack Removal procedure given later in this section). Normally, power supply switch/circuit breaker is left ON to continue supplying dc power to the drive.

DATA PACK HANDLING AND STORAGE

CAUTION

Always remove the data pack when the drive is moved from one location to another. Failure to do so could cause damage to heads and data pack.

Data packs for the drive can be stored either on edge or flat. When storing the data packs flat, make sure that the hub cavity faces down to prevent contamination of components located in the hub cavity. Do not stack the data packs. Take care to prevent stored packs from falling, sliding, or bumping. Packs stored on edge should be restrained so they can't fall over.

Store data packs in the same environment as the drive so that they are stabilized to the drive temperature prior to installation. When bringing a data pack into the drive environment, allow at least one hour for the data pack to stabilize to the ambient temperature of the drive environment before installing it in the drive.

DATA PACK INSTALLATION

NOTE

Contact your Imprimis account sales representative for data pack part numbers.

This procedure describes data pack installation for the drive. Data packs can be removed or installed only when power has been applied to the drive and when the Ready indicator is not on. Refer to figure 2-2 when performing the following steps:

1. Press START switch if Ready indicator is on and wait until Ready indicator stops flashing.

NOTE

If front door will not open in next step, power supply switch/circuit breaker must be switched ON.

2. Pull door handle to open front door.

3. Position data pack according to labels on data pack housing prior to insertion into drive.

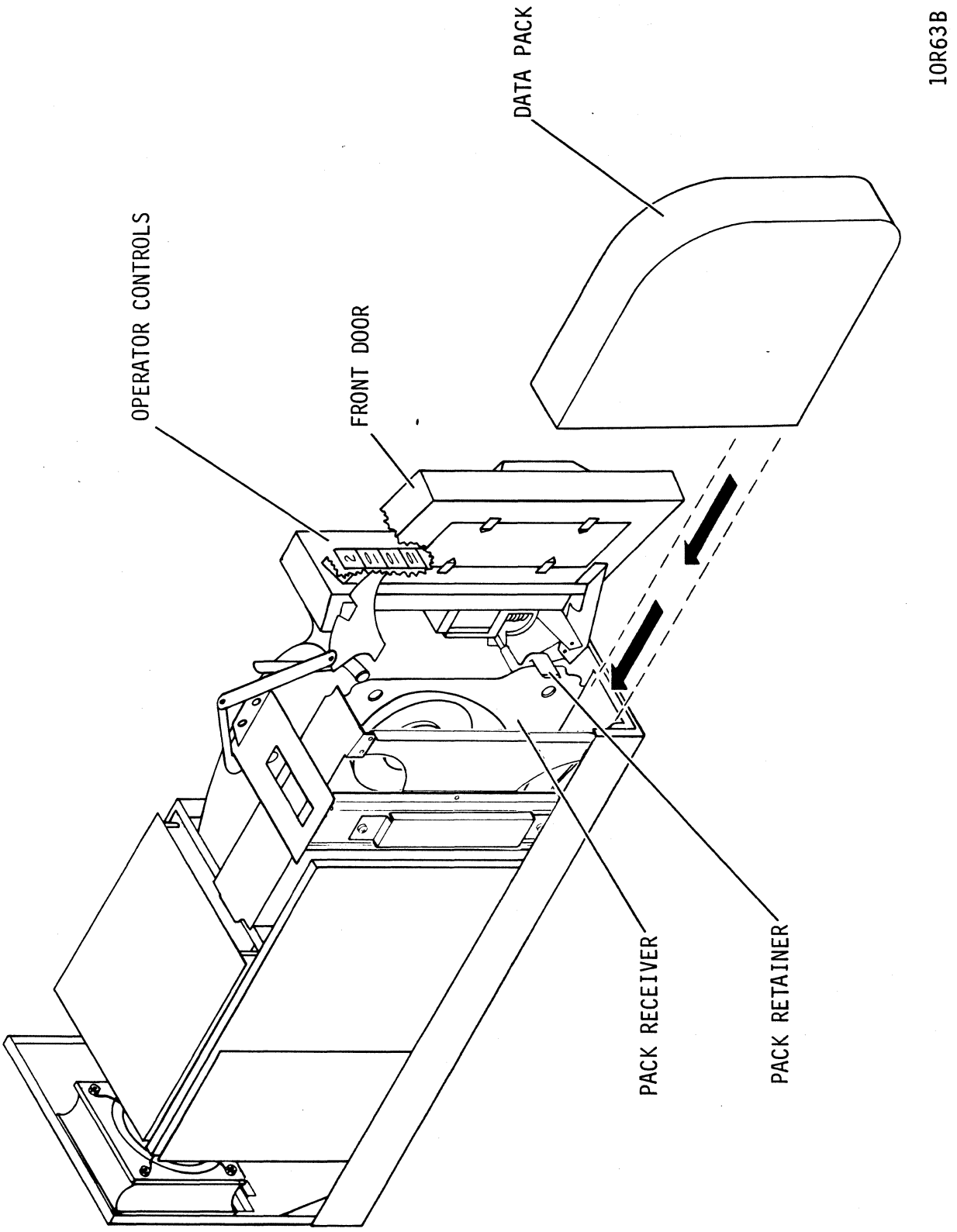


Figure 2-2. Data Pack Installation and Removal

NOTE

If the following step is unsuccessful, check labels on data pack housing to ensure that data pack is inserted with correct orientation.

4. Slide data pack into pack receiver. Observe that pack retainer secures data pack when it is fully inserted into pack receiver.

5. Close front door.

With data pack installed and front door closed, drive can be powered up. Refer to instructions in Power On Procedure.

DATA PACK REMOVAL

This procedure describes data pack removal for the drive. Data packs can be removed or installed only when power has been applied to the drive and when the Ready indicator is not on. Refer to figure 2-2 when performing the following steps:

1. Press START switch if Ready indicator is on and wait until Ready indicator stops flashing.

NOTE

If front door will not open in next step, power supply switch/circuit breaker must be switched ON. If front door still will not open, a problem exists that requires the attention of qualified maintenance personnel.

2. Pull door handle to open front door. Observe that pack retainer releases data pack and data pack partially ejects when door is opened fully.

3. Slide data pack out of pack receiver. Refer to Data Pack Handling and Storage for information on storing data packs.

4. Close front door.

DATA PACK WRITE PROTECTION

The position of the write protect tab on a data pack determines whether or not the drive can write new data on that data pack. Figure 2-3 identifies both tab positions. Sliding the tab into the write protect position inhibits write operations with that data pack. When a write-protected data pack is installed in

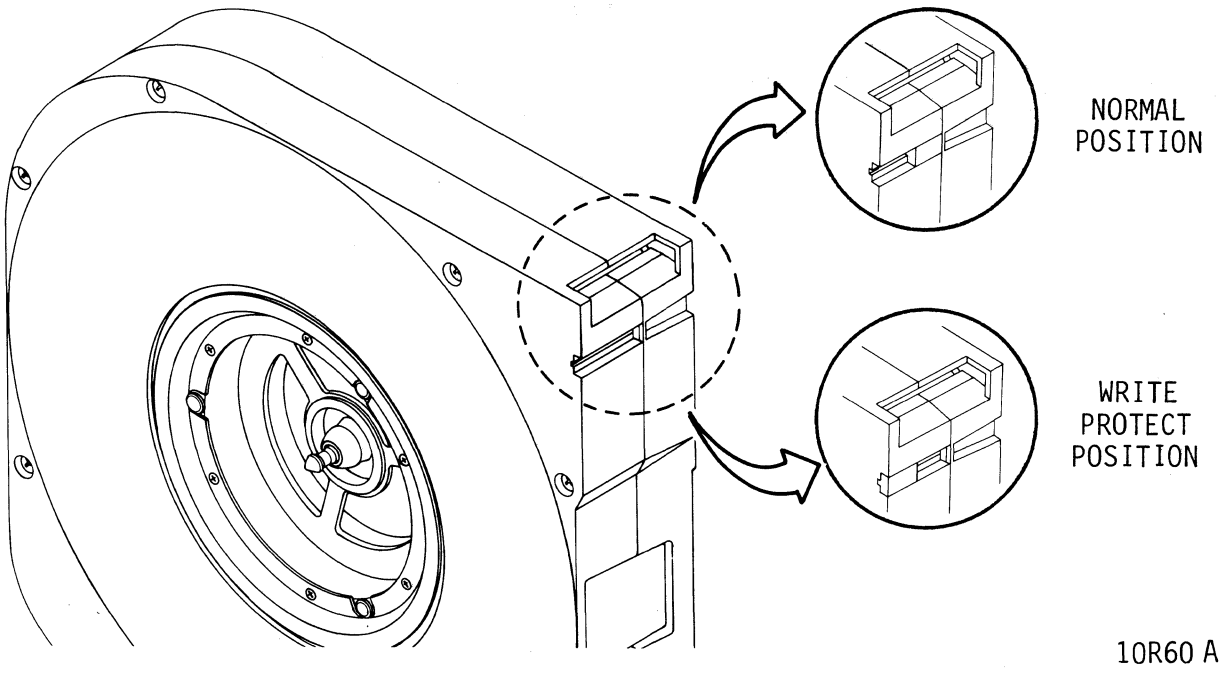


Figure 2-3. Write Protect Tab

the drive, the WRITE PROTECT indicator lights, and existing data stored on that data pack cannot be altered. Returning the tab to the normal position enables write operations with that data pack.

PRIMARY FILTER REPLACEMENT AND CLEANING

GENERAL

The primary air filter must be clean to ensure proper air circulation through the drive. The filter is mounted on the front door, as shown in figures 2-4 and 2-5. The operator should inspect the filter periodically and either replace or clean it when it is dirty. Cleaning the filter is recommended only if replacement filters are not available. The interval for filter maintenance depends on the operating environment. In computer room conditions, a 6-month interval is suggested. In other conditions, the filter should be checked more frequently.

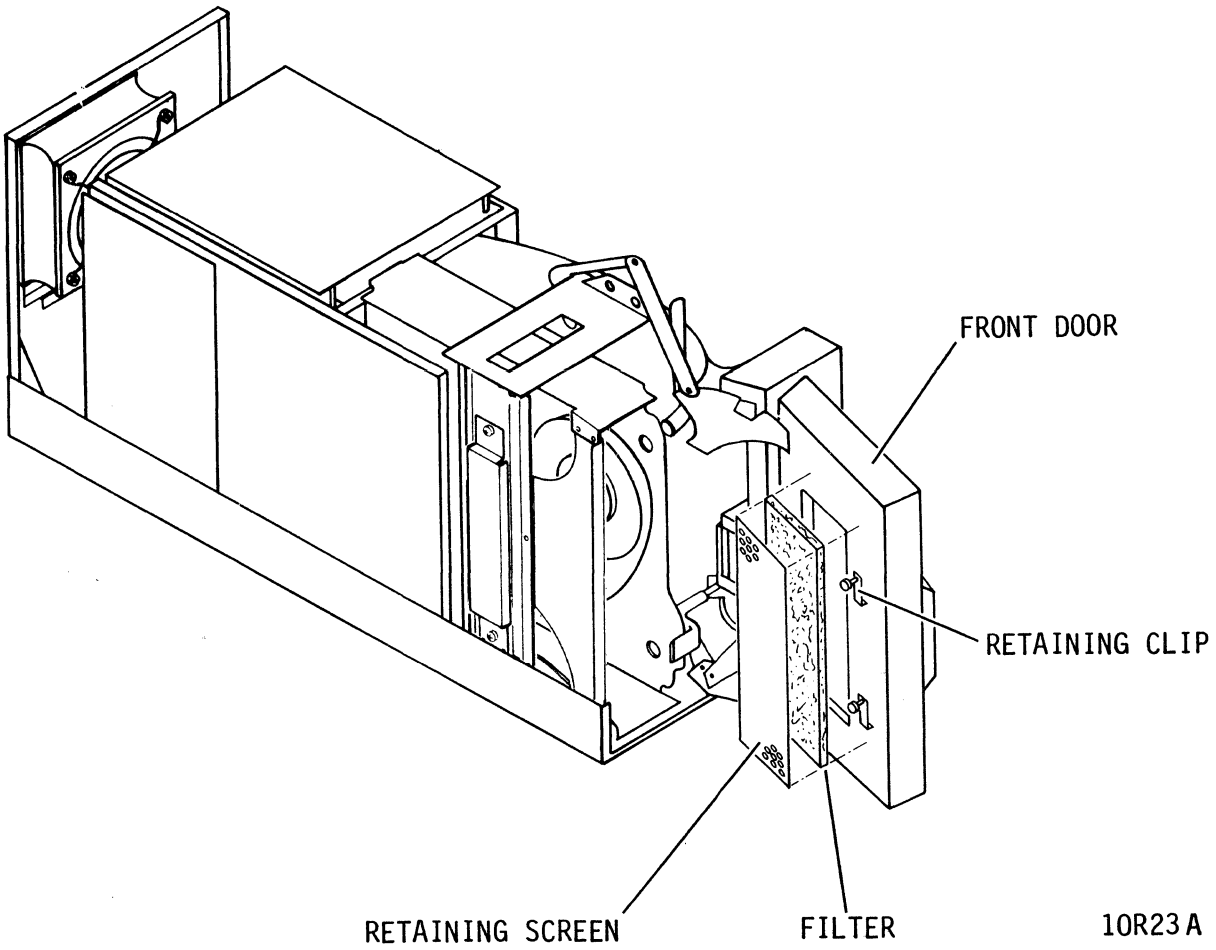


Figure 2-4. Primary Air Filter Replacement (S/C 01)

FILTER REPLACEMENT (S/C 01)

1. Perform Data Pack Removal procedure to open front door and remove pack. Leave front door open to gain access to filter.

2. Loosen hardware securing filter, retaining screen, and retaining clips.

3. Rotate retaining clips and remove retaining screen and old filter.

4. Place retaining screen and new filter in position against front door, and secure them with retaining clips and attaching hardware.

5. Reinstall data pack (if desired) and close front door.

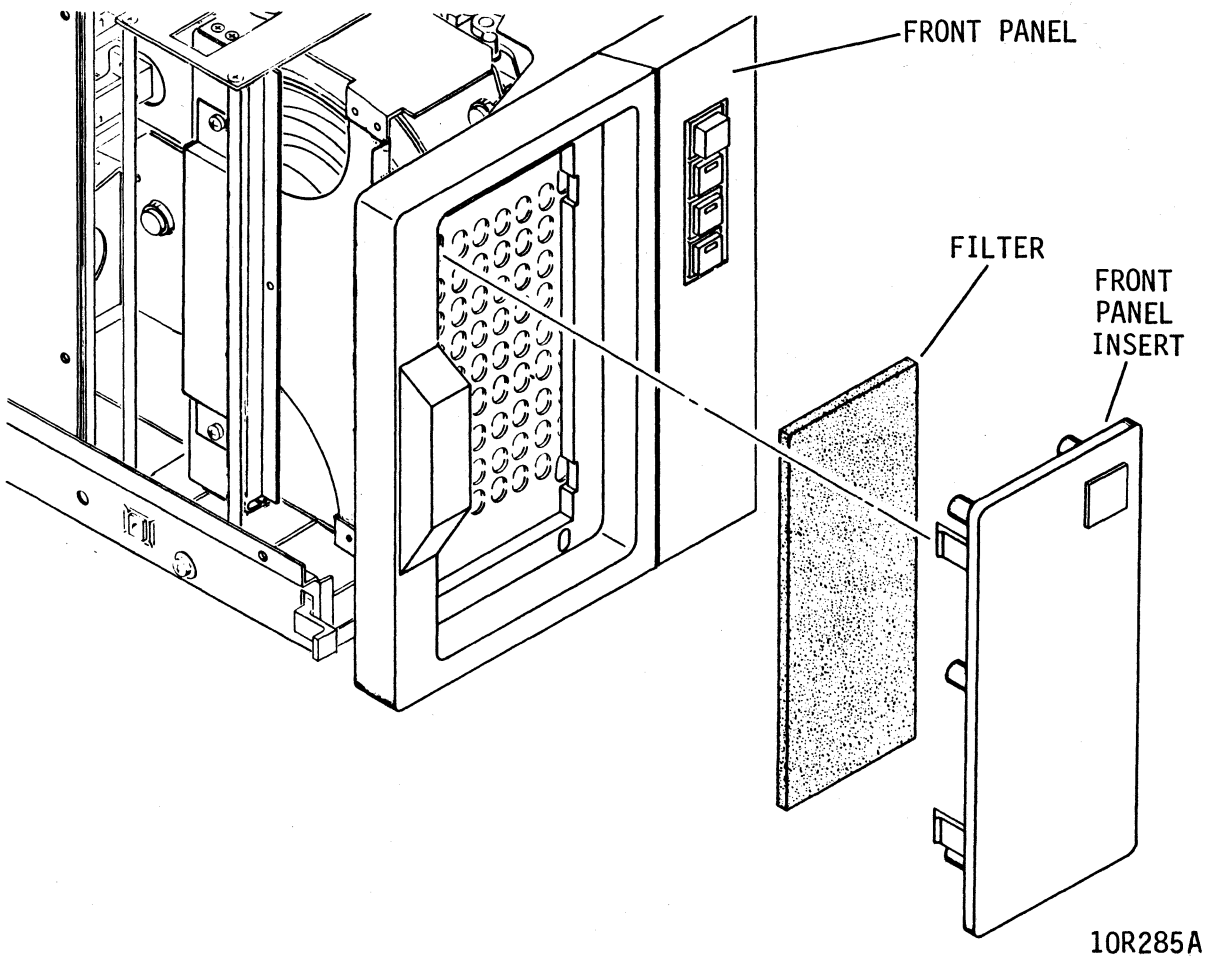


Figure 2-5. Primary Air Filter Replacement (S/C 02 and Above)

FILTER CLEANING (S/C 01)

The filter should not be cleaned if replacement filters are available.

1. Perform Data Pack Removal procedure to open front door and remove pack. Leave front door open to gain access to filter.

2. Loosen hardware securing filter, retaining screen, and retaining clips.

3. Rotate retaining clips and remove retaining screen and filter.

4. Clean filter by agitating in solution of water and mild detergent.

5. Rinse filter thoroughly with clean running water and allow to dry.

6. Place retaining screen and filter in position against front door, and secure them with retaining clips and attaching hardware.

7. Reinstall data pack (if desired) and close front door.

FILTER REPLACEMENT (S/C 02 AND ABOVE)

1. Remove panel insert by pulling forward to disengage catches securing insert to front panel.

2. Remove old filter.

3. Install new filter.

4. Replace panel insert by aligning catches to slots in front panel, and pushing on insert until catches snap into place.

FILTER CLEANING (S/C 02 AND ABOVE)

The filter should not be cleaned if replacement filters are available.

1. Remove panel insert by pulling forward to disengage catches securing insert to front panel.

2. Remove filter.

3. Clean filter by agitating in solution of water and mild detergent.

4. Rinse filter thoroughly with clean running water and allow to dry.

5. Install filter.

6. Replace panel insert by aligning catches to slots in front panel, and pushing on insert until catches snap into place.

SECTION 3

INSTALLATION AND CHECKOUT

INSTALLATION AND CHECKOUT 3

INTRODUCTION

The information contained in this section describes installation and initial checkout of the drive.

SITE REQUIREMENTS

GENERAL

The site requirements considered are electrostatic discharge protection, environment, space, power, grounding, and interface.

ELECTROSTATIC DISCHARGE PROTECTION

All drive electronic assemblies are sensitive to static electricity, due to the electrostatically sensitive devices used within the drive circuitry. Although some of these devices such as metal-oxide semiconductors are extremely sensitive, all semiconductors as well as some resistors and capacitors may be damaged or degraded by exposure to static electricity.

Electrostatic damage to electronic devices may be caused by a direct discharge of a charged conductor, or by exposure to the static fields which surround charged objects. To avoid damage to drive electronic assemblies, service personnel must observe the following precautions when servicing the drive:

- Ground yourself to the drive whenever the drive electronics are or will be exposed. Connect yourself to ground with a wrist strap (refer to Accessories in section 4 for part numbers). Connection may be made to any metal assembly or to the ground jack at the rear of the drive. As a general rule, remember that you, the drive, and the circuit boards must all be at ground potential to avoid potentially damaging static discharges.

- Keep boards in conductive bags - when circuit boards are not installed in the drive, keep them in conductive static shielding bags (refer to Accessories in section 4 for part numbers). These bags provide absolute protection from direct static discharge and from static fields surrounding charged objects. Remember that these bags are conductive and should not be placed where they might cause an electrical short circuit.

- Remove boards from bags only when you are grounded - all boards received from the factory are in static shielding bags, and should not be removed unless you are grounded.
- Turn off power to drive before removing or installing any circuit boards.
- Never use an ohmmeter on any circuit boards.

ENVIRONMENTAL REQUIREMENTS

All environmental requirements for the drive are listed in table 3-1.

TABLE 3-1. ENVIRONMENTAL REQUIREMENTS

Conditions	Characteristics	Specifications
TEMPERATURE		
Storage	Range	-10 to 50°C (14 to 122°F)
	Maximum change per hour	15°C (27°F)
Transit	Range	-40 to 60°C (-40 to 140°F)
	Maximum change per hour	20°C (36°F)
Operating	Range	10 to 45°C (50 to 114°F)
	Maximum change per hour	10°C (18°F)

Table Continued on Next Page

TABLE 3-1. ENVIRONMENTAL REQUIREMENTS (Contd)

Conditions	Characteristics	Specifications
RELATIVE HUMIDITY		
Storage	Range	10% to 90%
Transit	Range	5% to 95%
Non-operating	Range	20% to 80% 10% per hour maximum change
Operating	Range	20% to 80% 10% per hour maximum change
BAROMETRIC PRESSURE (STANDARD DAY)		
Storage/ Non-Operating	Range	-300 m to 3000 m (-983 ft to 10 000 ft) 105 kPa to 69 kPa (31 in Hg to 20 in Hg)
Transit	Range	-300 m to 3000 m (-983 ft to 10 000 ft) 105 kPa to 69 kPa (31 in Hg to 20 in Hg)
Operating	Range	-300 m to 3000 m (-983 ft to 10 000 ft) 105 kPa to 69 kPa (31 in Hg to in Hg)

SPACE REQUIREMENTS

The drive slide mounts side-by-side with another drive into a 483 mm (19 in) standard rack. The slide action allows a complete outward extension of either unit for ease of maintenance. The space requirements are shown in figure 3-1.

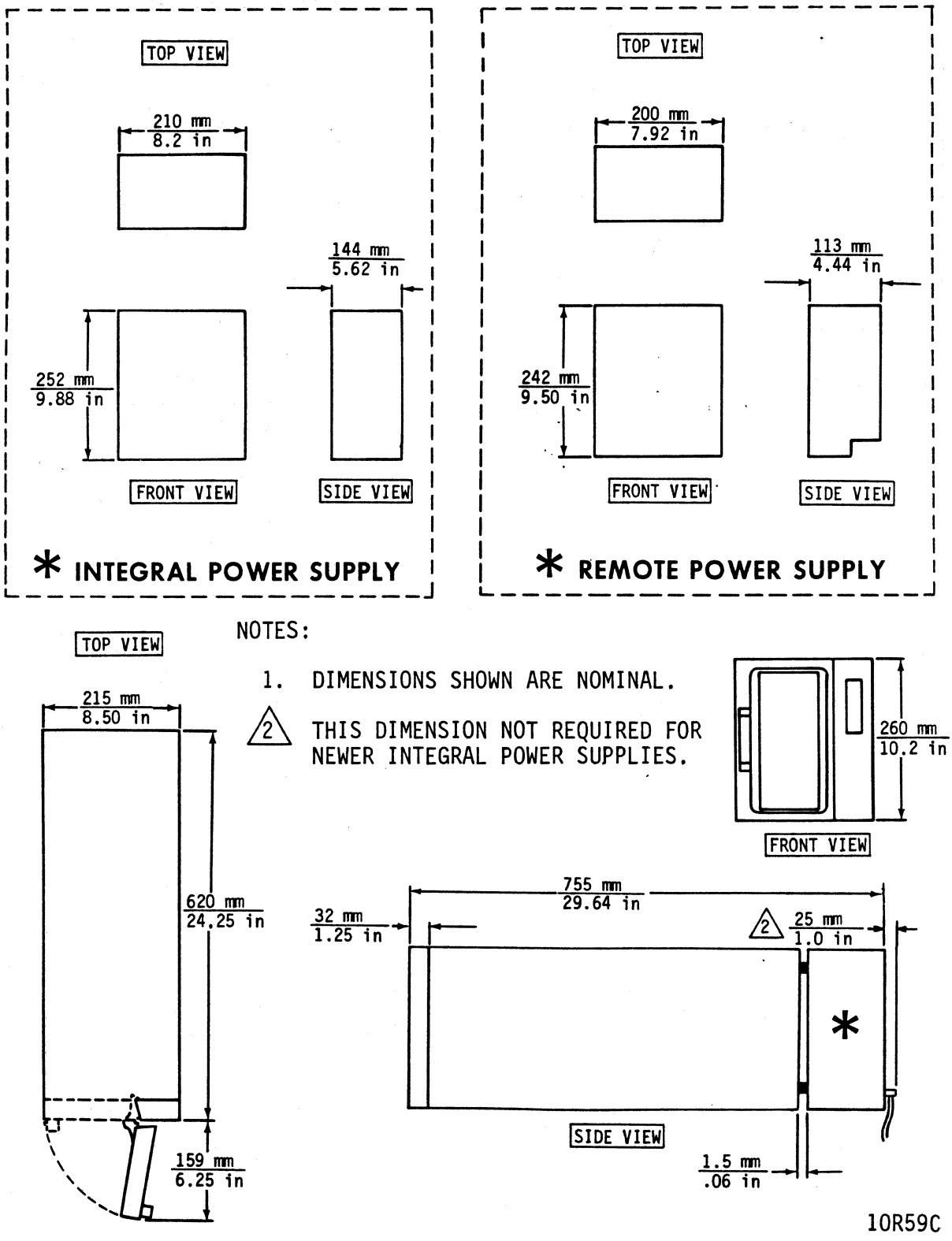


Figure 3-1. Drive Space Requirements

The combined mass of the drive and power supply is 32.6 kg (72 lb). With both units mounted inline and extended on the slides, the center of gravity is approximately 36 cm (14 in) from the rack front.

POWER REQUIREMENTS

WARNING

This unit has a single-phase power supply with a capacitor input filter (sometimes called a switching type supply). If power to the unit originates from a 3-phase, 4-wire, wye branch or feeder circuit, ensure that the circuit meets the latest requirements of the United States National Electrical Code. Failure to meet these requirements may result in hazardous conditions due to high currents (and heating) in the neutral conductors and transformers supplying the system.

Drive ac power requirements are listed in table 3-2. Conversion to the different line voltages is explained in the installation procedures. If an ac cord is not supplied with the unit, either order one from Imprimis (see figure 3-8 and the parts data section) or obtain one commercially per the specifications in table 3-3. Drive current versus start-up time is shown in figure 3-2 for 120 and 220/240 volt connections.

GROUNDING REQUIREMENTS

Safety grounding (connecting the drive power cord to a grounded outlet), and system grounding (establishing a common ground between the drives, the power supplies, and the controller), are discussed in the following paragraphs.

Safety Grounding

A safety ground must be provided by the site ac power system. The green (or green and yellow striped) wire in the drive's power cord provides the safety ground connection between the power supply and the site power system. In turn, the site ac power system must tie this connection (safety ground) to earth ground. All site ac power connection points, including convenience outlets for test equipment, must be maintained at the same safety ground potential.

TABLE 3-2. NORMAL POWER REQUIREMENTS

Specifications	Values	
	100/120 V ac	208/240 V ac
Voltage Range	87 to 128 V	179 to 256 V
Nominal Line Frequency	50/60 Hz	50/60 Hz
Frequency Range	48.0 to 62.0 Hz	48.0 to 62.0 Hz
Phase Requirements	Single Phase	Single Phase
Power Consumed*		
Integral Pwr Sup	0.237 kW	0.241 kW
Remote Pwr Sup	0.244 kW	0.236 kW
Line Current*		
Integral Pwr Sup	3.5 A	2.1 A
Remote Pwr Sup	2.8 A	1.6 A
Power Factor*		
Integral Pwr Sup	0.68	0.56
Remote Pwr Sup	0.73	0.69
Start Up Current	See figure 3-2.	See figure 3-2.
*Measured when disks are rotating and carriage is moving.		

TABLE 3-3. AC CORD SET MINIMUM RATINGS

Used On	Current	Voltage	Conductor Size	Number of Conductors
100 to 120 V 50/60 Hz	13 A	125 V	16 AWG	3
208 to 240 V 50/60 Hz	6 A	250 V	16 AWG	3
Note: Cord set must be U.L. Listed, C.S.A. Certified, and one of the following basic cord types: SV, SP-2, SP-3, S, or SJ. A cord set is defined as a cord with its connectors attached.				

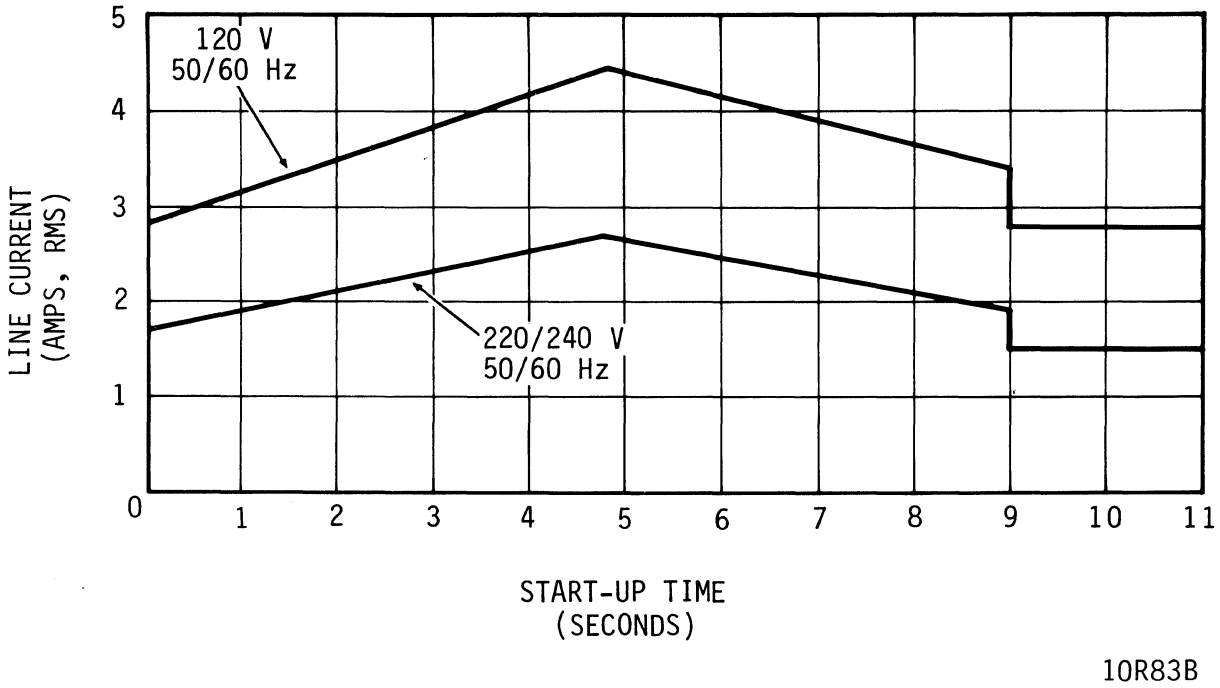


Figure 3-2. Line Current Versus Start-up Time

System Grounding

In addition to safety grounding, system ground connections are also required. System ground is established by a set of ground straps connected in a star or daisy chain configuration. The ground straps connect ground on the controller to earth ground and to each power supply in the system. The interconnect cabling between each drive and its power supply connects case ground on the power supply to case ground on the drive. The installation procedures in this section provide detailed grounding instructions and a schematic diagram of the star and daisy chain configurations.

INTERFACE REQUIREMENTS

An important part of site preparation is planning the layout and routing of I/O cables. The I/O cables are designated as A and B cables. The I/O A cables may be connected in either a star or daisy chain configuration as shown in figure 3-3. Each configuration calls for the use of terminators; these too are shown in figure 3-3.

The following discussion of the I/O configurations applies to single channel installations where a set of drives are interfaced to one controller. Extending the discussion to dual

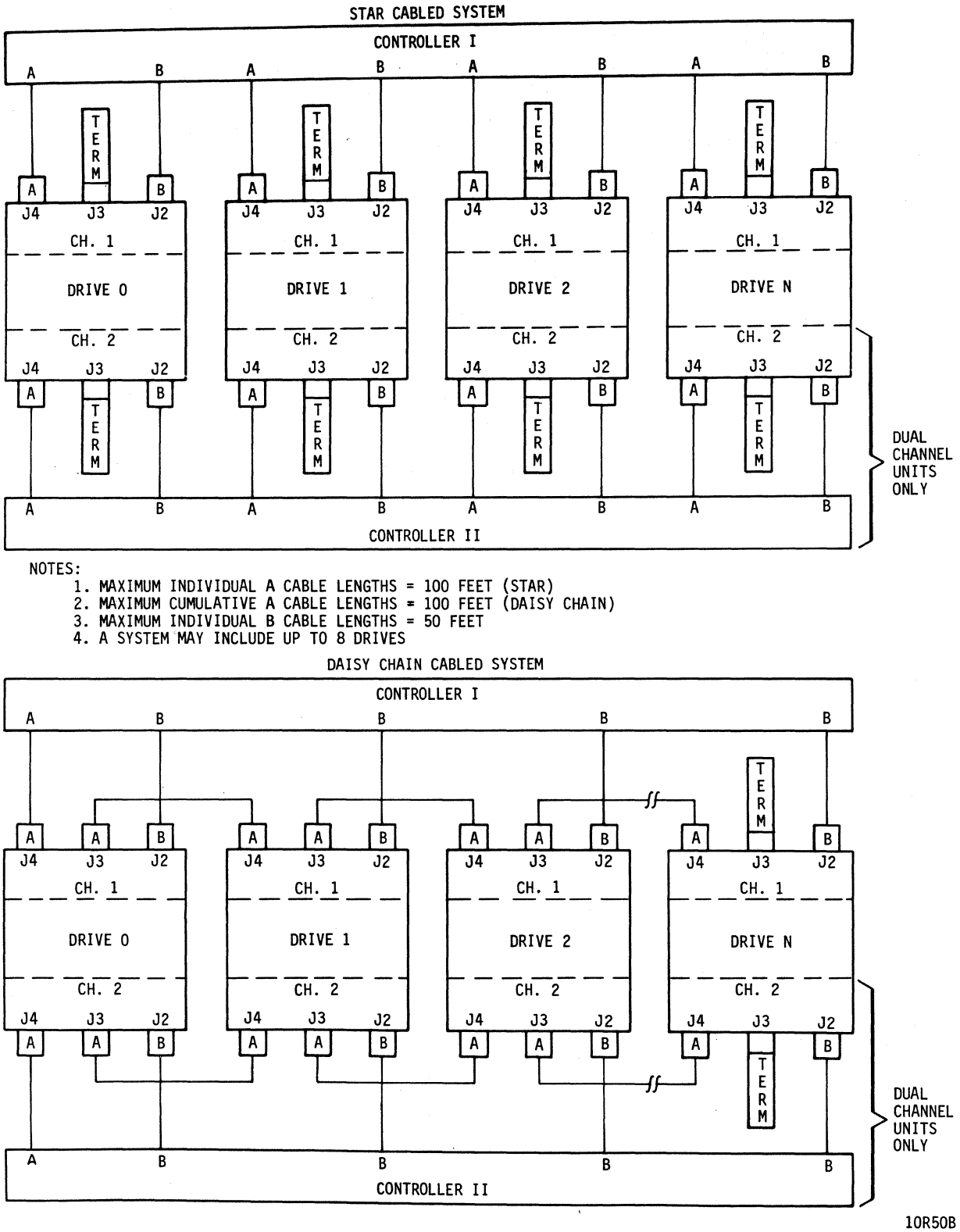


Figure 3-3. System Cabling

channel installations (involving two controllers) requires doubling the quantities of cables and terminators because the two channels have independent cabling.

The star configuration has individual A and B cables going from the controller to each drive, and each drive has a terminator installed on it. The daisy chain configuration has individual B cables going from the controller to each drive. However, a single A cable connects the controller to the first drive. Other A cables go from drive to drive, and the last drive in the string has a terminator installed on it.

In estimating the I/O cables needed for an installation, decide which configuration will be used and allow sufficient length to permit extension of rack-mounted drives. Limitations on I/O cable lengths may influence system layout. The maximum length for each B cable is 15.3 m (50 ft). Each star system A cable or the cumulative A cabling in a daisy chain system cannot exceed 30.6 m (100 ft) in length. Refer to Accessories in section 4 for terminator and I/O cable part numbers.

Figure 3-4 shows the pin assignments and signal names for the A cable. Figure 3-5 shows the pin assignments and signal names for the B cable. Detailed information about interface lines is given in section 1 of the hardware maintenance manual, volume 2.

FINAL UNPACKAGING AND INSPECTION

GENERAL

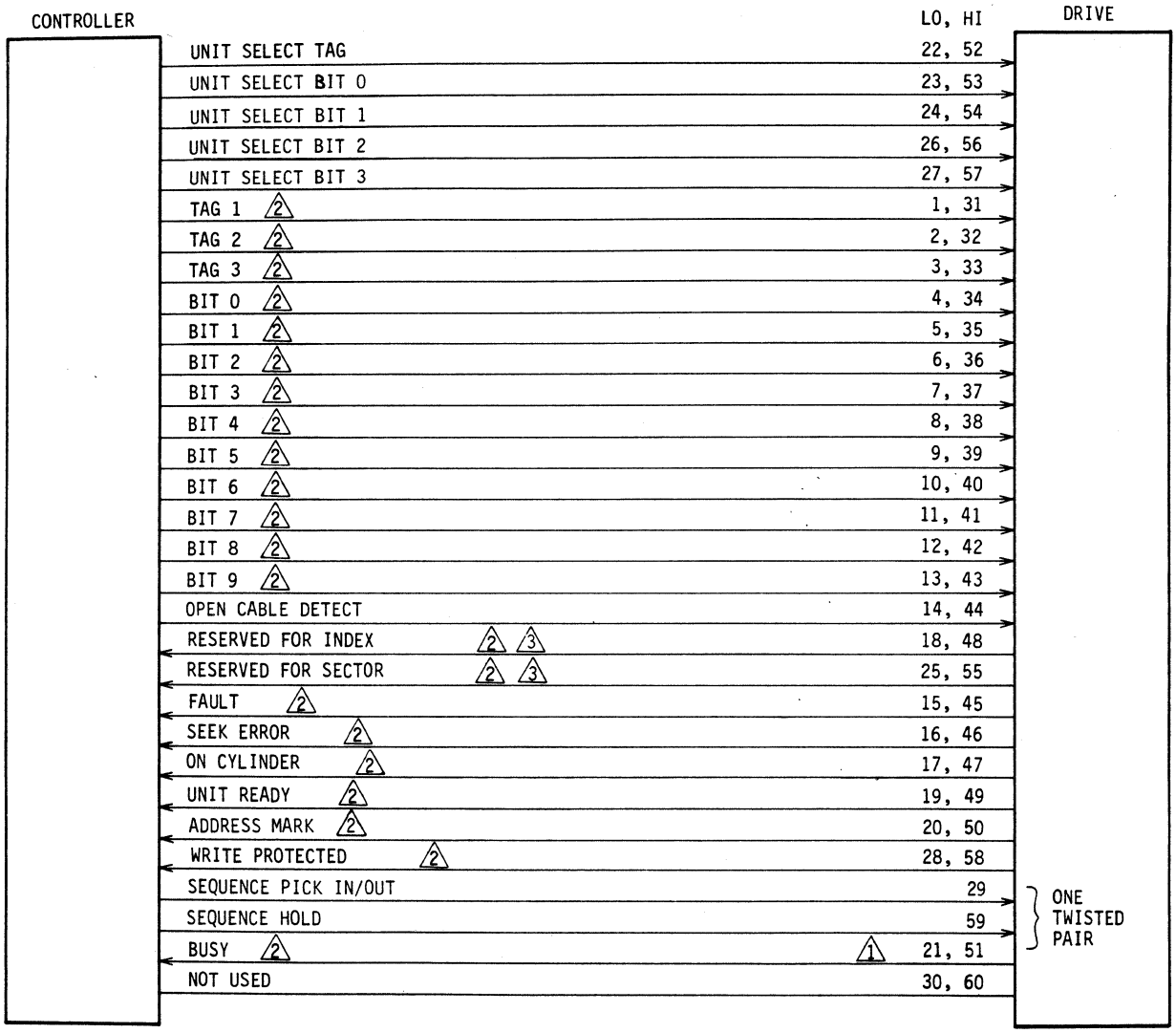
WARNING

Always remove the data pack when the drive is moved from one location to another. Failure to do so could cause damage to heads and data pack.

After removing packaging material according to the unpackaging instructions provided with the drive, inspection for shipping damage should be carried out and several final unpackaging procedures performed. Most packaging materials can be reused if it is necessary to ship the drive at some future date. To obtain packaging instructions, contact:

Imprimis Technology Incorporated
Customer Services
5950 Clearwater Drive
Minnetonka, MN 55343

Phone: 1-800-382-6060
Fax: (612) 931-8817



NOTES:

(1) DUAL CHANNEL UNITS ONLY

(2) GATED BY UNIT SELECT

(3) INDEX AND SECTOR MAY BE IN "A" CABLE, "B" CABLE, OR "A" AND "B" CABLES.

10R339A

Figure 3-4. A Cable

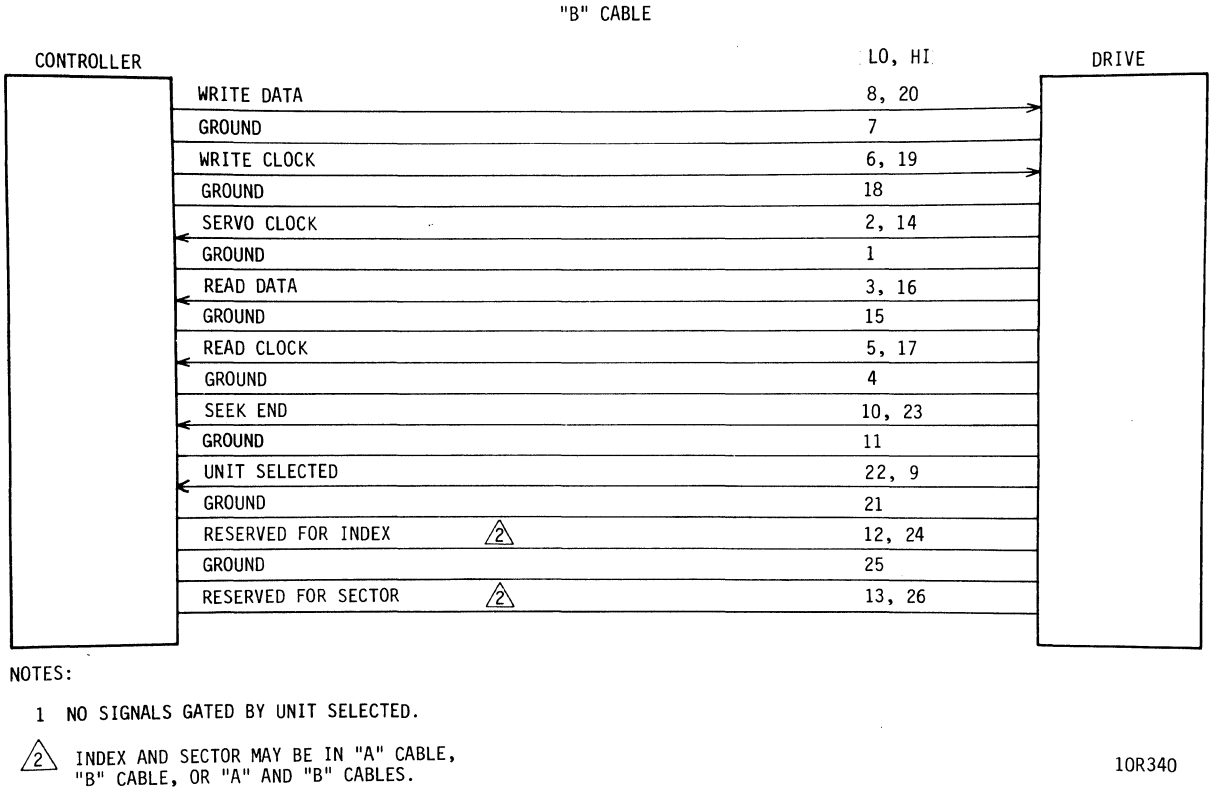


Figure 3-5. B Cable

When ordering packaging instructions, specify the exact equipment number and series code of the drive as shown on the equipment identification label.

UNPACKAGING

1. Open package (save all packaging materials).

2. If drive has a slide mount option, remove packages containing two slide mounts and slide mount hardware kit.

3. Remove package containing ac and dc power cables (if applicable).

4. Remove plastic dust cover from around drive.

5. Check all items against shipping bill for required equipment and hardware to complete installation. Discrepancies, missing items, damaged equipment, etc., should be reported to the Imprimis account sales representative responsible for the equipment.

INSPECTION

Inspect all components of the drive for possible shipping damage. All claims for shipping damage should be filed with the carrier involved.

INSTALLATION PROCEDURES

GENERAL

The following text provides the procedures necessary to install the drive and power supply. It is assumed that the requirements for site preparation have been completed prior to performing the installation procedures.

The following procedures should be considered in the order presented, but the order may be altered for a specific installation:

- Mounting Drive in Rack
- Remote Power Supply Bracket Installation
- Power Supply Voltage Conversion
- System I/O Cabling
- System Grounding and Interconnect Cabling
- Mounting Remote Power Supply in Rack
- Setting Circuit Board Switches.

MOUNTING DRIVE IN RACK

A drive mounting kit for mounting the drive in a standard rack is available as an accessory (refer to Accessories in section 4 for part number). For drives with the integral power supply, the support bracket must be removed prior to slide installation (see figure 3-6). For drives with the remote power supply, the slide assemblies permit inline mounting of the drive and remote power supply. With the slides fully extended, both units are positioned beyond the front surface of the rack for ease of maintenance. The following procedures provide instructions for attaching the drive and integral or remote power supply to the slides.

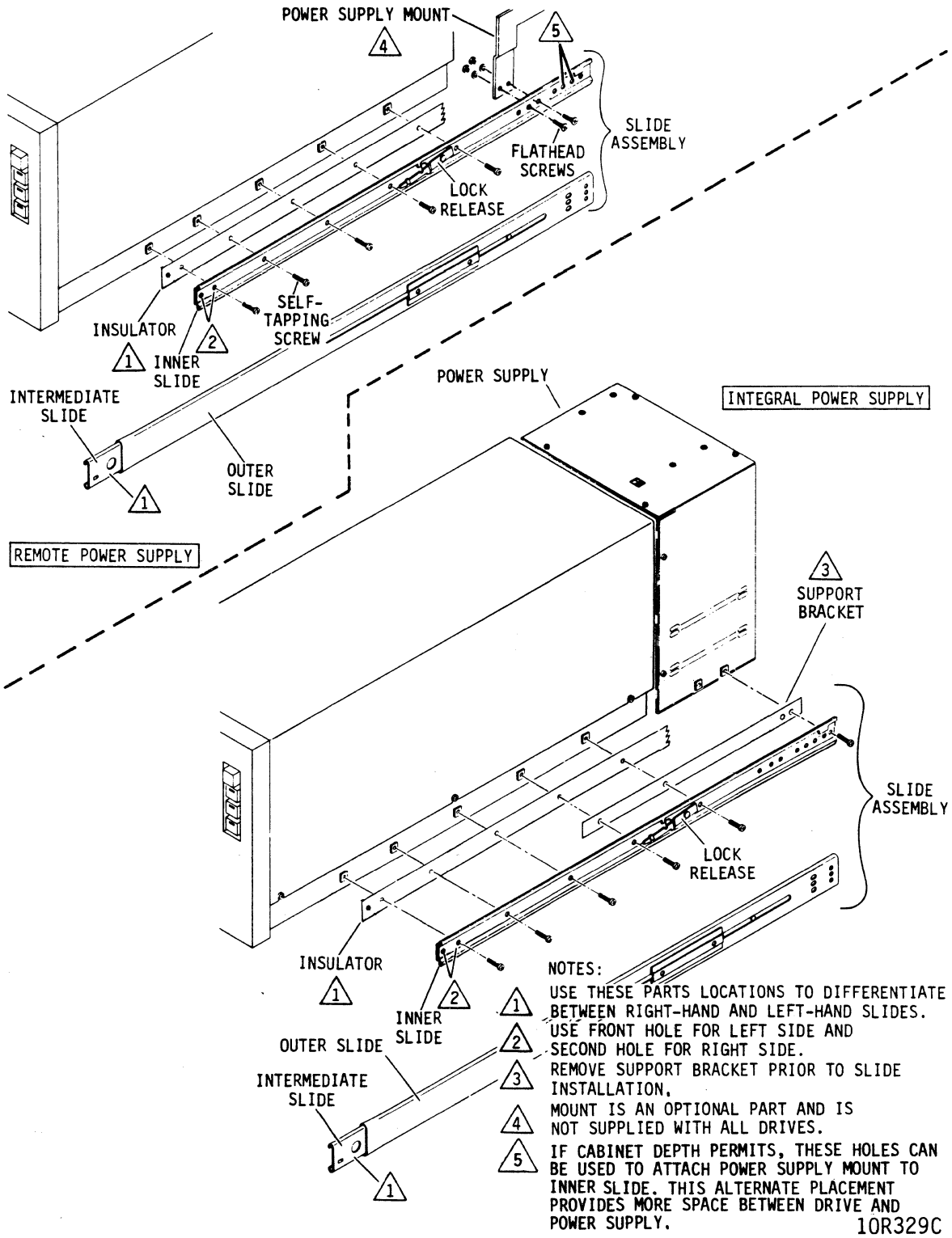


Figure 3-6. Drive Installation

NOTE

The procedure describing how to mount the remote power supply on the slide assemblies follows System Grounding and Interconnect Cabling.

Drive Installation (Integral Power Supply)

1. Remove support bracket (one on each side) from drive. Discard brackets and retain screws for inner slide installation on drive (see figure 3-6).

2. Remove mounting screws from slide hardware kit.

3. Disengage inner slide from intermediate and outer slides of each slide assembly by pressing lock release and pulling out inner slide.

4. Mount right-hand and left-hand inner slides and insulators on drive by installing screws through holes in inner slide into square nuts in drive. Figure 3-6 defines which slide component is used on the right-hand side of the drive.

5. Mount right-hand and left-hand outer slides of slide assemblies in rack in accordance with user requirements. Figure 3-6 defines which slide component mounts on the right side of the rack.

6. Push each intermediate slide to fully retracted position inside outer slide.

7. Lift drive and guide inner slides into intermediate slides of slide assemblies. Continue pushing slides together until their lock releases engage.

8. Disengage shipping locks by turning shipping lock screws (accessed through holes in right side of top cover) fully counterclockwise. Remove shipping lock instruction tag, with shipping clip attached, from front of drive.

Drive Installation (Remote Power Supply)

1. Remove mounting screws from slide hardware kit.

2. Disengage inner slide from intermediate and outer slides of each slide assembly by pressing lock release and pulling out inner slide (see figure 3-6).

3. Install remote power supply mounts (if supplied) on inner slides using mounting hardware.

4. Mount right-hand and left-hand inner slides on drive by installing screws through holes in inner slide into square nuts in drive. Figure 3-6 defines which slide component is used on the right-hand side of the drive.

5. Mount right-hand and left-hand outer slides of slide assemblies in rack in accordance with user requirements. Figure 3-6 defines which slide component mounts on the right side of the rack.

6. Push each intermediate slide to fully retracted position inside outer slide.

7. Lift drive and guide inner slides into intermediate slides of slide assemblies. Continue pushing slides together until their lock releases engage.

8. Disengage shipping locks by turning shipping lock screws (accessed through holes in right side of top cover) fully counterclockwise. Remove shipping lock instruction tag, with shipping clip attached, from front of drive.

REMOTE POWER SUPPLY BRACKET INSTALLATION

If the power supply is to be installed on the slide assemblies, a mounting bracket must first be attached to the power supply. Newer drives will have the bracket already attached. On older drives, attach bracket as follows:

1. Remove and discard the 4 screws from power supply, where bracket attaches (see figure 3-7).

2. Align the bracket holes with the vacated holes in power supply and secure into place using the four 6-32 x 3/8 screws supplied with hardware kit.

POWER SUPPLY VOLTAGE CONVERSION

The power supply is configured before shipment to operate in one of two ranges of ac input voltages. The equipment label on the power supply indicates the voltage range selected prior to shipment. The voltage range for drives with the integral power supply is determined by setting the voltage programming switch to the desired range. The voltage range for drives with the remote power supply is determined by: 1) on older supplies, which voltage programming plug is installed inside the power supply, or 2) on newer supplies, setting the voltage program-

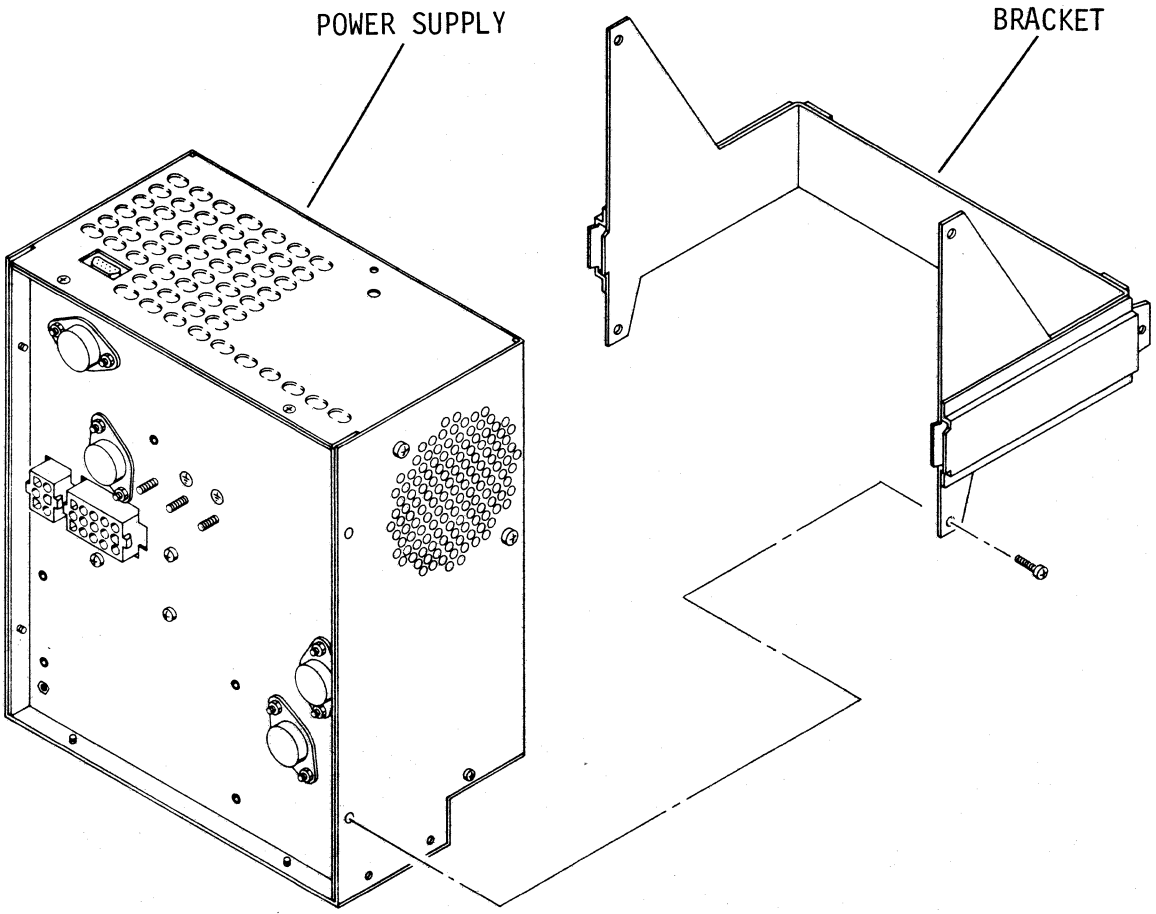


Figure 3-7. Remote Power Supply Bracket Installation

ming switch to the desired range. The ac power cord must be replaced if the voltage range is changed. Either order an Imprimis cord (see figure 3-8 and the parts data section) or select a commercially available cord per the specifications in table 3-3.

1. Ensure that ac power cable is disconnected from power supply.

NOTE

Perform step 2 on integral supplies, and on newer remote supplies, which have a voltage programming switch. Perform step 3 on older remote supplies, which do not have a voltage programming switch.

2. Change voltage programming switch to desired setting.

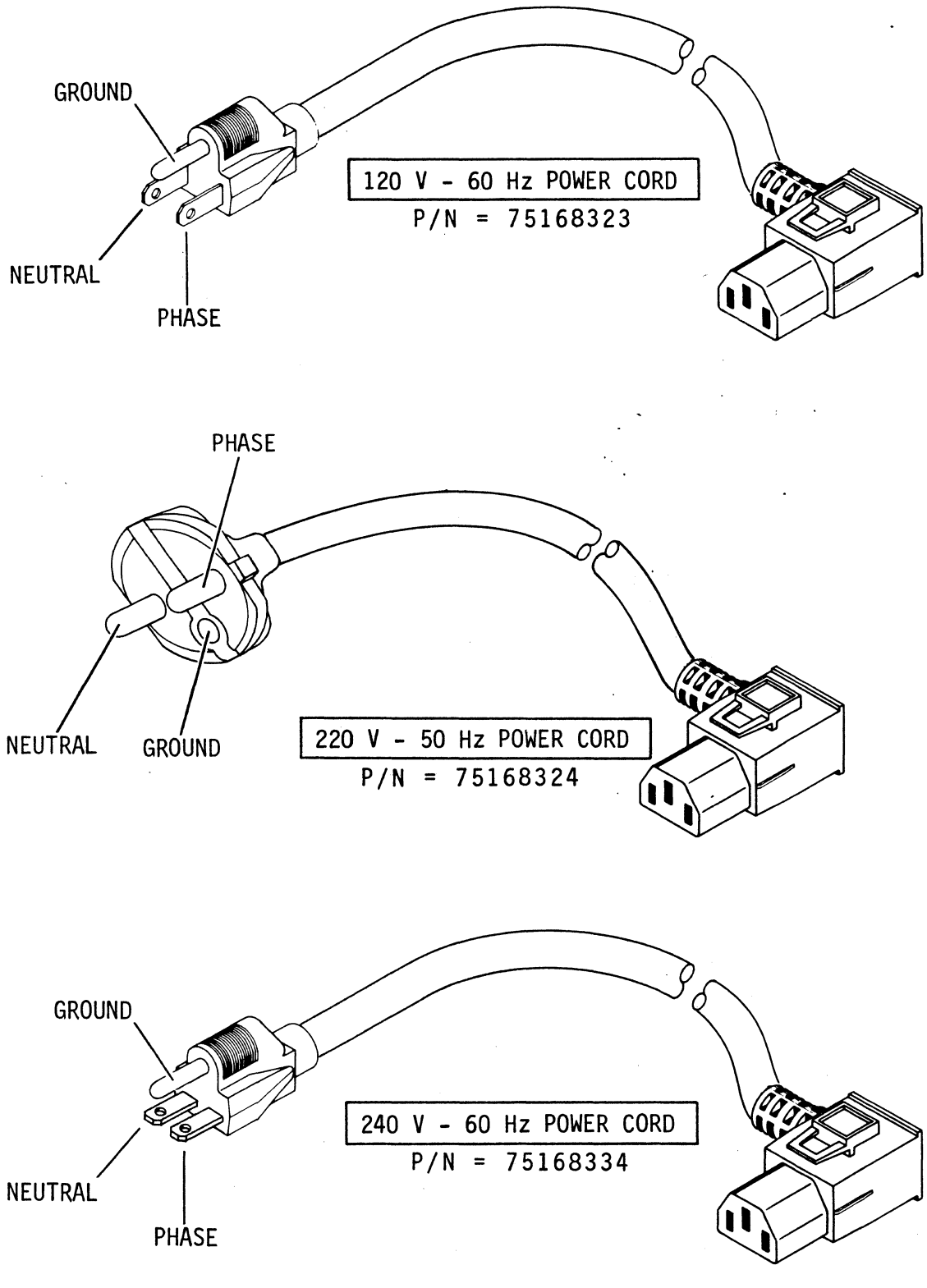


Figure 3-8. AC Power Cables

3. On older remote power supplies, perform the following:

   a. Remove attaching hardware (designated "A" in figure 3-9) from power supply.

   b. Place power supply on work surface with bottom cover facing up.

CAUTION

Use caution during the following steps to avoid damaging internal components and wiring.

   c. Slide bottom cover and front panel away from main chassis without straining internal wiring.

   d. Remove attaching hardware (designated "B") and tilt bottom cover away from front panel to expose voltage programming plug.

NOTE

The voltage programming plugs are stamped to indicate their voltage ranges. The plug for 120 V ac has blue jumper wires, and the plug for 220/240 V ac has red jumper wires.

   e. Squeeze retaining tabs and remove voltage programming plug from its socket. Install replacement voltage programming plug in socket.

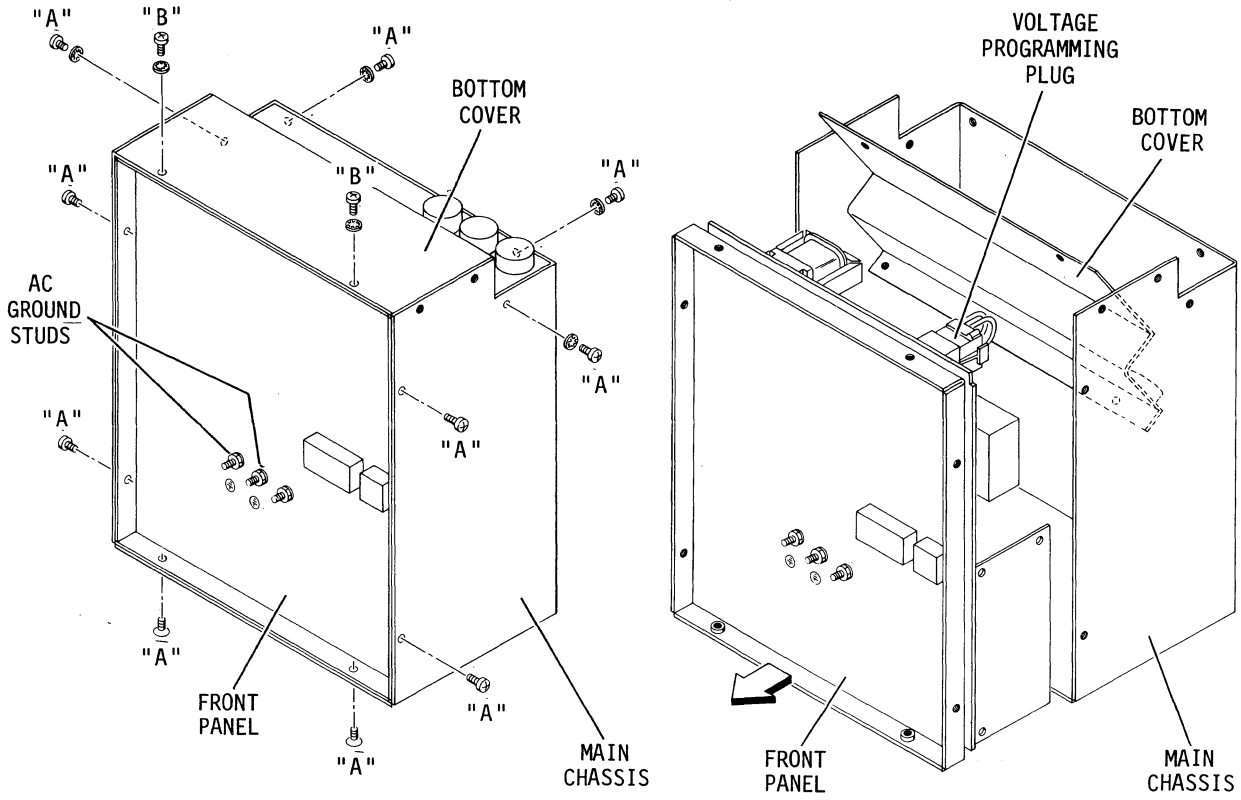
   f. Align bottom cover with front panel and replace attaching hardware (designated "B").

   g. Slide bottom cover and front panel back into alignment with main chassis.

   h. Install hardware (designated "A") to attach bottom cover and front panel to main chassis.

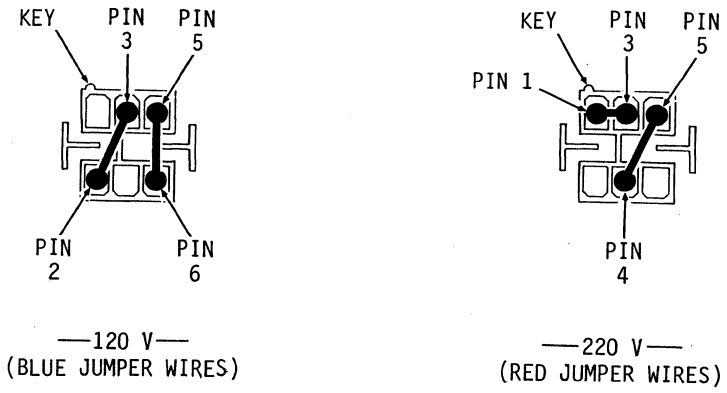
4. Modify equipment label to reflect new ac operating voltage range for power supply.

5. Replace existing ac power cable with the ac power cable specified for new operating voltage.



NOTES:

1. REMOVE HARDWARE DESIGNATED "A" PRIOR TO REMOVING HARDWARE DESIGNATED "B"



10R84B

Figure 3-9. Voltage Conversion (Older Remote Power Supplies)

SYSTEM I/O CABLING

This procedure describes how to connect the I/O cables and terminators. The recommended connections are A cable to J4 and terminator to J3. These connections may be reversed without affecting drive operation. Figure 3-10 shows typical I/O cable connections at the drive I/O plate.

The site preparation information, provided earlier in this section, describes both star and daisy chain cable routing. With the correct number of terminators and lengths of I/O cables available, you are ready to begin connecting the system I/O cabling. Unless otherwise noted, each step in the following procedure applies to all drives in the system.

In installations where the remote power supply is slide mounted directly behind the drive, it is necessary to remove the power supply from the slides to connect or disconnect the I/O cables.

1. Remove I/O shield from I/O plate (see figure 3-10).

2. Install cable bracket on panel below I/O plate with attaching hardware.

NOTE

Steps 3 through 6 apply to single channel drives and must be repeated for dual channel drives. The I/O plate on dual channel drives has two sets of connectors: 1J2, 1J3, and 1J4 for channel 1, and 2J2, 2J3, and 2J4 for channel 2.

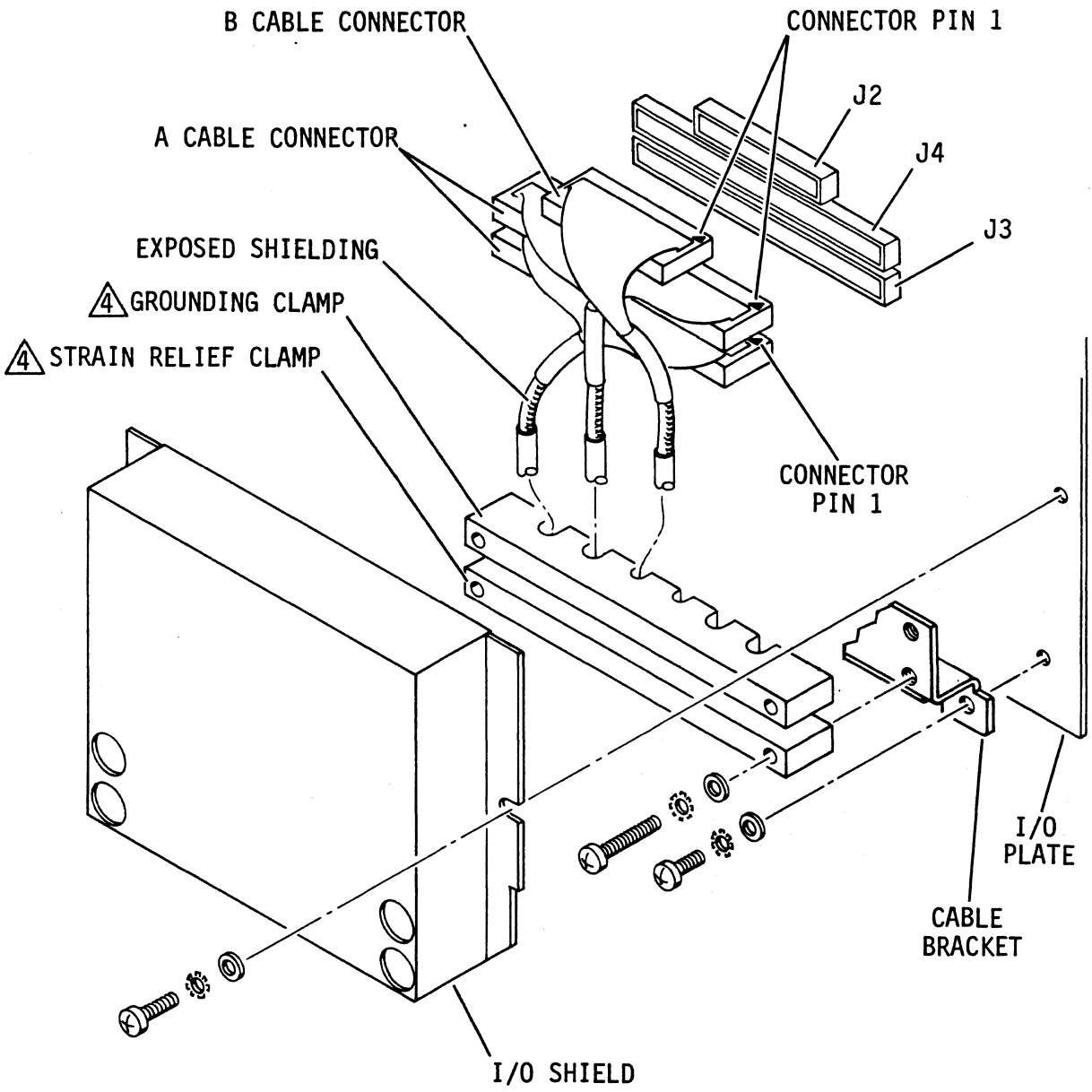
3. Connect B cables from controller to connector J2 on each drive.

NOTE

Figure 3-3 defines star and daisy chain systems. In star systems, repeat step 4 for each drive, and skip to step 6. In daisy chain systems, perform step 4 for first drive in daisy chain and repeat step 5 for remaining drives.

4. Connect A cable from controller to drive connector J4.

5. Connect A cable from connector J3 on each drive to connector J4 on next drive in daisy chain.



NOTES:

1. CABLE BRACKET IS ATTACHED TO EITHER REAR PANEL OR I/O PLATE, DEPENDING ON DRIVE CONFIGURATION.
2. EXACT PLACEMENT OF CONNECTORS J2, J3, AND J4 ON I/O PLATE VARIES.
3. I/O SHIELD IS USED ON INTEGRAL POWER SUPPLY ONLY.

4 CABLE OPENINGS ARE LARGER ON STRAIN RELIEF CLAMP THAN ON GROUNDING CLAMP.

11D13F

Figure 3-10. I/O Cable Attachment (Typical)

6. Install terminator on drive connector J3 and make terminator ground connection (see figure 3-11). Terminators are required on:

   - all drives in a star system.
   - last drive in a daisy chain system.

NOTE

On each I/O cable, there are several locations where heat shrink tubing can be removed to expose the ground shield. By selecting the proper section of heat shrink for removal in the following step, the ground shield will be exposed only where it is contacted by the grounding clamp.

7. Strip heat shrink tubing from all cables so that bare shielding will be in contact with grounding clamp.

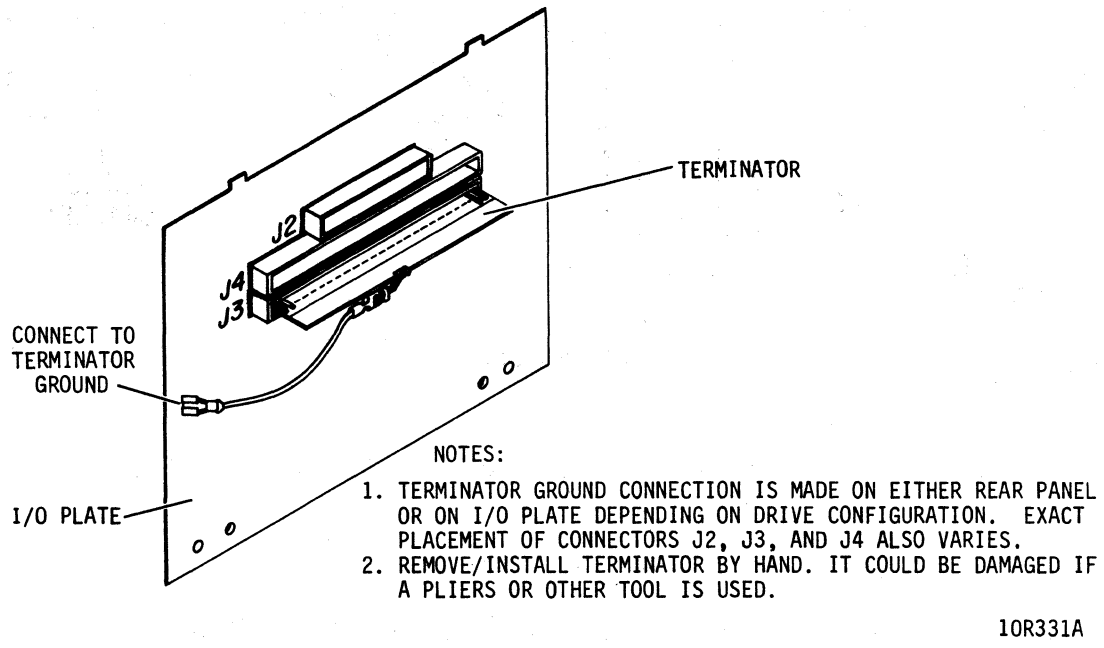


Figure 3-11. Terminator Installation (Typical)

8. Loosely install grounding clamp (grounding clamp has smaller diameter openings than strain relief clamp) onto cable bracket with cables positioned as shown in figure 3-10. Ensure that bare shielding on each cable is in contact with grounding clamp.

9. Position cabling so that outer insulation begins just below grounding clamp; then secure grounding clamp into place. This will ensure that the strain relief clamp (installed in the following step) is in contact with outer insulation of cabling.

10. Install strain relief clamp onto cable bracket with cables positioned as shown in figure 3-10.

11. Install I/O shield on I/O plate with attaching hardware.

SYSTEM GROUNDING AND INTERCONNECT CABLING

This section contains instructions on grounding the system and interconnecting the remote power supply and drive. It is assumed that the site has been prepared in accordance with the site requirements information provided earlier in this section. The following procedures describe how to ground the system in a star or daisy chain configuration as shown in figure 3-12.

For drives with the integral power supply, interconnect ground cabling between drive and power supply has already been installed during manufacturing. For drives with remote power supply, interconnect cabling is supplied with each drive and installed on site, between case ground on each drive and case ground on its power supply. Refer to Accessories in section 4 for grounding accessories part numbers.

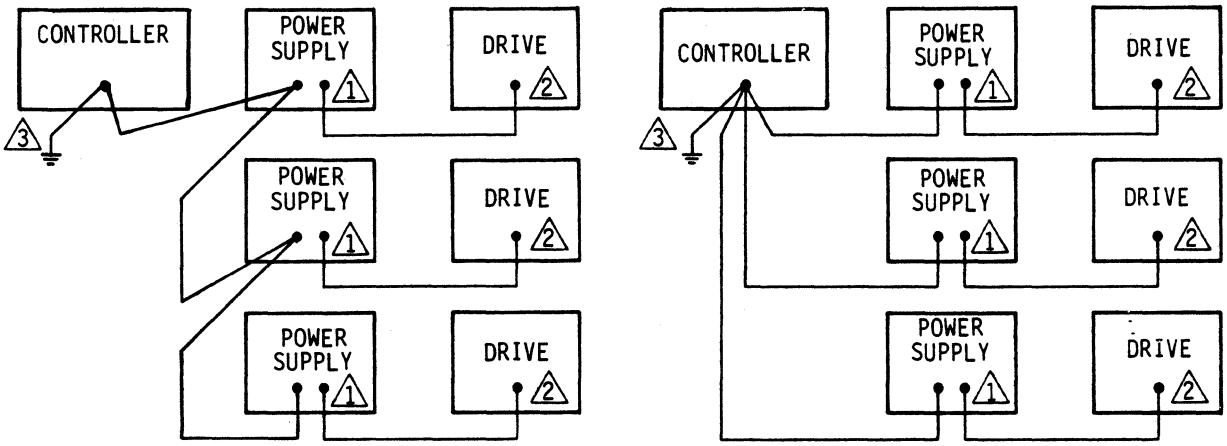
Star Grounding Procedure

This procedure describes how to ground the system in a star configuration. In this configuration, ground straps connect the controller ground to each power supply in the system as shown in figure 3-12.

1. Prepare ground straps as follows:

   a. Allowing sufficient length for drive extension, cut ground straps to length needed for the following connections:

      - Controller to earth ground
      - Controller to each power supply



NOTES:

1. GROUND CONNECTIONS TO POWER SUPPLY USE STUDS MARKED ⏚ THERE MUST BE NO CONNECTION TO STUD MARKED "± 5V RET."
2. DRIVE IS GROUNDED AT "DC GND" SCREW ON DRIVE REAR PANEL.

   IF DRIVE HAS INTEGRAL POWER SUPPLY:
   DC GROUND CABLE BETWEEN DRIVE AND POWER SUPPLY HAS ALREADY BEEN INSTALLED DURING MANUFACTURING.

   IF DRIVE HAS REMOTE POWER SUPPLY:
   DRIVES SUPPLIED WITH ONE-FOOT DC POWER CABLE HAVE A SEPARATE GROUND STRAP THAT CONNECTS BETWEEN POWER SUPPLY AND DRIVE. DRIVES SUPPLIED WITH A LONGER DC POWER CABLE USE THE CABLE SHIELD FOR A GROUND CONNECTION BETWEEN POWER SUPPLY AND DRIVE. EACH END OF THESE CABLES HAS A SEPARATE GROUND STRAP CONNECTED TO GROUND SHIELD.

3. EARTH GROUND CONNECTION

11D15A

Figure 3-12. System Grounding Diagram

b. Crimp and solder terminal lugs to both ends of each ground strap.

2. Referring to figure 3-12, connect ground straps to controller as follows:

   a. Connect one end of each of the ground straps to controller ground terminal.

   b. Connect one of the ground straps to earth ground.

   c. Route the remaining ground straps to the power supplies.

NOTE

For drives with integral power supply, perform step 3 only. For drives with remote power supply, skip to step 4.

3. Connect a ground strap from controller to each power supply as follows:

   a. Remove nut and lockwasher from one of the system ground studs on each power supply. These studs are identified by ground symbols. The stud marked "+5V RET" is not used. See figure 3-13.

   b. Place lockwasher on ground stud. Then place terminal lug on stud and secure with nut.

NOTE

Ground connections to remote power supply precede installation of power supply in cabinet.

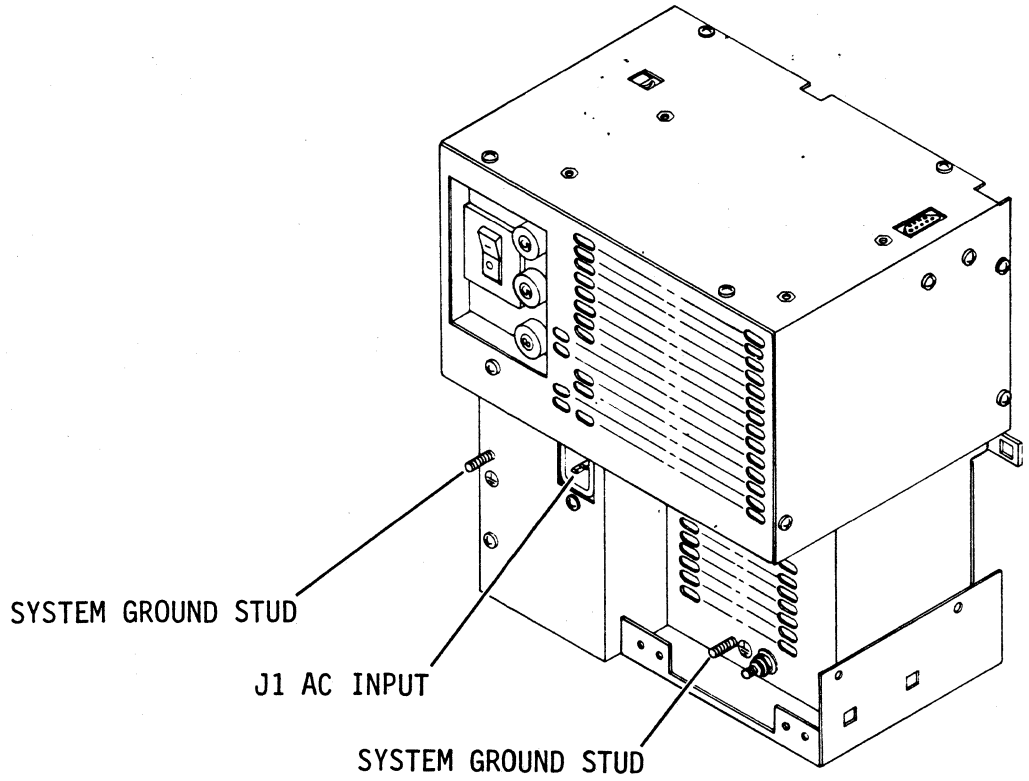
4. Referring to figure 3-9, attach a ground strap from controller to each power supply as follows:

   a. Locate power supply close to where it will be installed.

   b. Remove nuts and lockwashers from two ground studs on front panel of power supply. These studs are identified by ground symbols. The stud marked "$\pm$5V RET" is not used.

   c. Place lockwasher on ground stud farthest from connector J15.

   d. Place terminal lug of ground strap on stud and secure with nut.



NOTE:

1. PLACEMENT OF SYSTEM GROUND STUD AND AC INPUT CONNECTOR IS NOT THE SAME ON ALL INTEGRAL POWER SUPPLIES.

11D387

Figure 3-13. System Grounding (Integral Power Supply)

5. Identify whether dc power cable has a ground shield strap attached at each end. If it does, proceed with step 6. Otherwise, skip to step 7.

6. Referring to figures 3-12 and 3-14, connect shielded dc power cable between power supply and drive as follows:

   a. Connect shielded dc power cable between connector J15 on front panel of power supply and connector J40 on rear panel of drive.

   b. Place lockwasher on remaining ground stud on power supply.

   c. Place terminal lug of ground shield strap over lockwasher on stud and secure with nut.

NOTES:

1. SHIELDED DC POWER CABLE IS SHOWN. UNSHIELDED DC POWER CABLES REQUIRE SEPARATE GROUND STRAP.

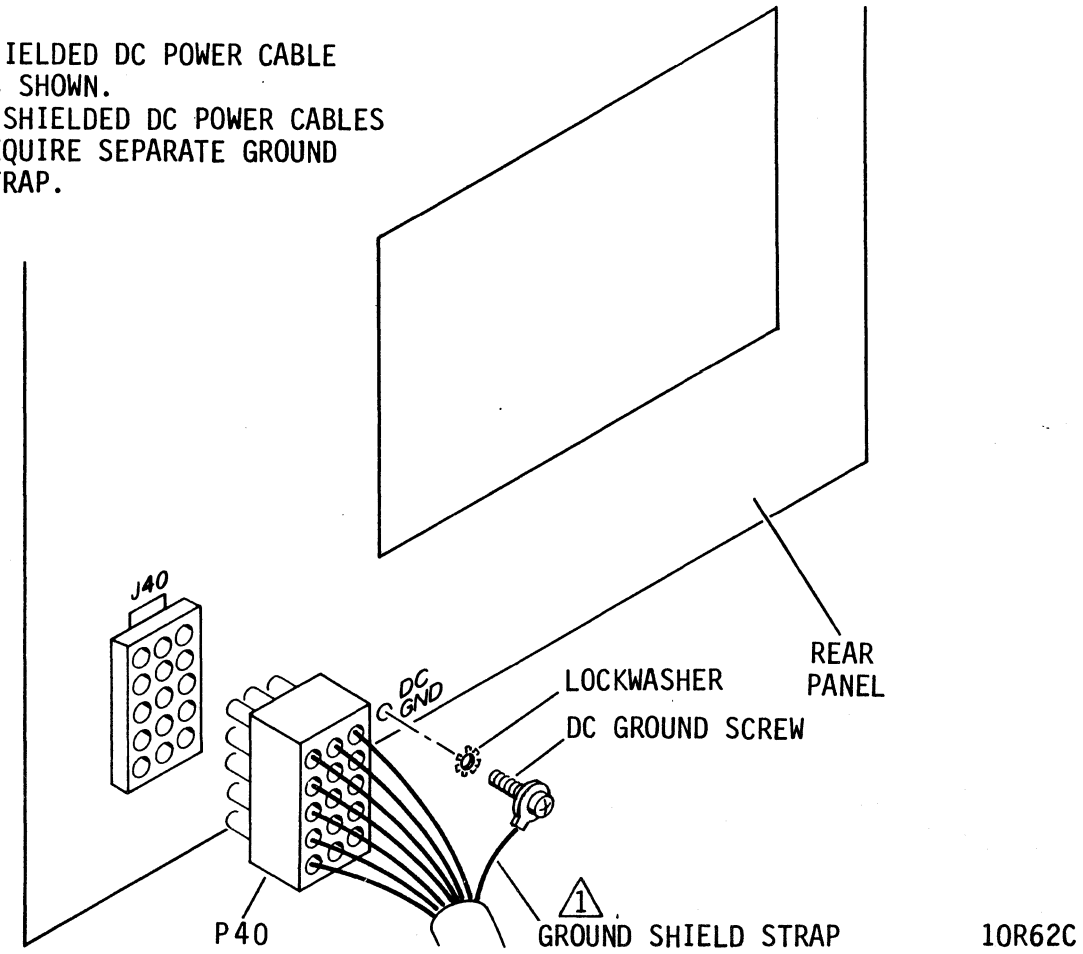


Figure 3-14. Drive Grounding (Remote Power Supply)

d. Remove DC GND screw and lockwasher from rear panel of drive.

e. Insert screw through terminal lug of ground shield strap and then through lockwasher.

f. Reinstall screw in rear panel of drive.

7. Referring to figures 3-12 and 3-14, connect the unshielded dc power cable and the ground strap between power supply and drive as follows:

   a. Connect unshielded dc power cable between connector J15 on front panel of power supply and connector J40 on rear panel of drive.

b. Place lockwasher on remaining ground stud on power supply.

c. Place terminal lug of ground strap over lockwasher on stud and secure with nut.

d. Remove DC GND screw and lockwasher from rear panel of drive.

e. Insert screw through terminal lug of ground strap and then through lockwasher.

f. Reinstall screw in rear panel of drive.

Daisy Chain Grounding Procedure

This procedure describes how to ground the system in a daisy chain configuration. In this configuration, a ground strap connects the controller ground to the first power supply in the system. The remainder of the power supplies are connected by grounding straps going from the first power supply to the second, the second to the third, and so on. See figure 3-12.

1. Prepare ground straps as follows:

   a. Allowing sufficient length for drive extension, cut ground straps to length needed for the following connections:

      - Controller to earth ground
      - Controller to nearest drive
      - Each drive to next drive in daisy chain

   b. Crimp and solder terminal lugs to both ends of each ground strap.

2. Referring to figure 3-12, connect ground straps to controller as follows:

   a. Connect two ground straps to controller ground terminal.

   b. Connect one of the ground straps to earth ground.

   c. Route the other ground strap to the first power supply in the daisy chain. Route the remaining ground straps (prepared in step 1) from power supply to power supply.

NOTE

For drives with integral power supply, perform step 3 only. For drives with remote power supply, skip to step 4.

3. Make the daisy chain ground connections at each power supply as follows:

   a. Remove nut and lockwasher from one of the system ground studs on each power supply. These studs are identified by ground symbols. The stud marked "+5V RET" is not used. See figure 3-13.

   b. Place lockwasher on ground stud. Then place terminal lug(s) on stud and secure with nut.

NOTE

Ground connections to remote power supply precede installation of power supply in cabinet.

4. Referring to figure 3-9, make daisy chain connections at each power supply as follows:

   a. Locate power supply close to where it will be installed.

   b. Remove nuts and lockwashers from two ground studs on front panel of power supply. These studs are identified by ground symbols. The stud marked "$\pm$5V RET" is not used.

   c. Place lockwasher on ground stud farthest from connector J15.

   d. Place terminal lug of ground strap(s) on stud and secure with nut.

5. Identify whether dc power cable has a ground shield strap attached at each end. If it does, proceed with step 6. Otherwise, skip to step 7.

6. Referring to figures 3-12 and 3-14, connect shielded dc power cable between power supply and drive as follows:

   a. Connect shielded dc power cable between connector J15 on front panel of power supply and connector J40 on rear panel of drive.

   b. Place lockwasher on remaining ground stud on power supply.

c. Place terminal lug of ground shield strap over lockwasher on stud and secure with nut.

d. Remove DC GND screw and lockwasher from rear panel of drive.

e. Insert screw through terminal lug of ground shield strap and then through lockwasher.

f. Reinstall screw in rear panel of drive.

7. Referring to figures 3-12 and 3-14, connect the unshielded dc power cable and the ground strap between power supply and drive as follows:

   a. Connect unshielded dc power cable between connector J15 on front panel of power supply and connector J40 on rear panel of drive.

   b. Place lockwasher on remaining ground stud on power supply.

   c. Place terminal lug of ground strap over lockwasher on stud and secure with nut.

   d. Remove DC GND screw and lockwasher from rear panel of drive.

   e. Insert screw through terminal lug of ground strap and then through lockwasher.

   f. Reinstall screw in rear panel of drive.

MOUNTING REMOTE POWER SUPPLY IN RACK

The following procedure provides instructions for mounting the remote power supply behind the drive on the slide assemblies and connecting the ac power cable to the supply. Power supplies on older units are mounted directly on the slide assemblies and do not use a mounting bracket. In this case, a second person is needed to support the power supply while the mounting hardware is being installed. Figure 3-8 shows the ac power cable provided with the power supply.

NOTE

If the power supply is not installed behind the drive, ensure that the location provides adequate clearance for good airflow, and connect ac power cable to AC INPUT connector J1 and site ac power source.

Units Without Mounting Bracket

1. Extend drive from rack to the full extension allowed by slide assemblies.

2. Support power supply above drive.

NOTE

At full slide extension, power supply mounting holes in inner slide are accessible through clearance holes in intermediate slide, as shown in figure 3-15.

3. Attach power supply to inner slides with screws provided in slide hardware kit.

4. Connect ac power cable to AC INPUT connector J1 and to site ac power source.

Units With Mounting Bracket

1. Ensure that power supply mounts have been installed on the slides as directed in Mounting Drive in Rack procedure.

2. Position power supply so that mounts and matching slots in bracket are aligned as shown in figure 3-15. Slide power supply toward drive until locking holes in bracket aligns with locking holes in mounts.

3. Secure power supply bracket to mounts with 8-32 x 5/16 screws, washers, and lockwashers.

4. Connect ac power cable to AC INPUT connector J1 and to site ac power source.

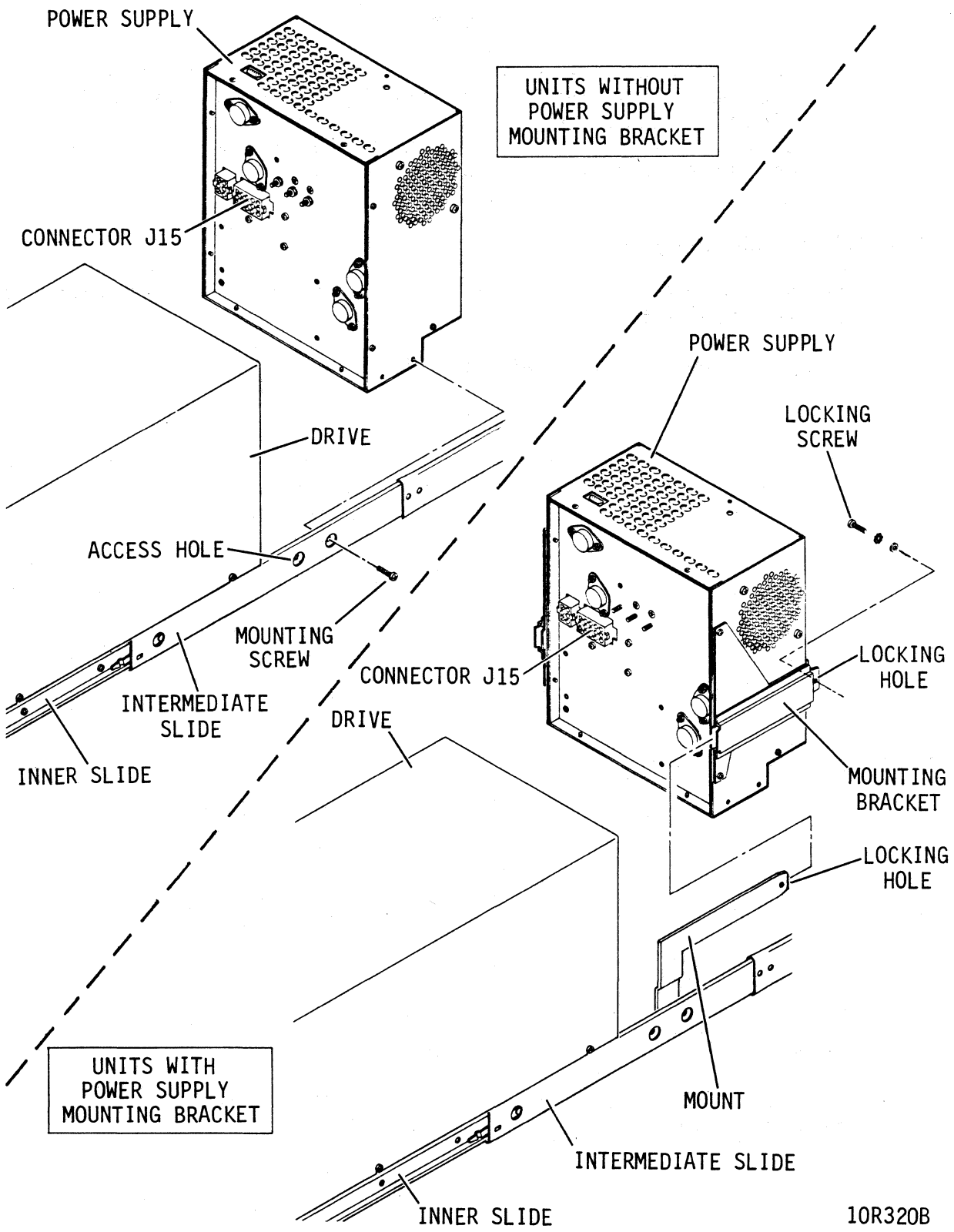


Figure 3-15. Installing Remote Power Supply on Slides

SETTING CIRCUIT BOARD SWITCHES

The I/O and control circuit boards inside the drive contain a number of switches that must be set correctly for normal operation of the drive. Figures 3-16 through 3-19 identify these switches and give their locations on the circuit boards.

You may encounter two types of switches. Refer to figure 3-20 for an illustration of these switches and how to set them. Rocker switches are actuated by pressing one end of the actuator or the other (rocking it) to turn the switch on (closed) or off (open). Slide switches are actuated by sliding the actuator one way or the other to turn the switch on or off. Use a slender ball point pen, a straightened paper clip, or any similar object to change switch settings. Do not use a lead pencil point as it may break off and lodge in the switch, or cause the switch to malfunction.

Figures 3-16 through 3-19 give the correct settings for normal drive operation for all switches except the sector select switches. Setting the sector select switches is discussed in the following paragraphs.

Figure 3-19 shows the location of the Sector Select switch assembly. The Sector Select switch assembly has twelve independent switches used for selecting sectors. The number of sectors per revolution generated by the drive logic must be matched to that required by the controller. Therefore, sector select switches are provided in the drive logic to allow selection of different sector counts.

Two methods are provided for determining sector switch settings. One is a recommended method, and the other is an alternate method. The two methods are identical when the number of sector clocks per revolution of the disk is evenly divisible by the number of sectors. However, if the division has a remainder, the two methods treat the remainder differently. With the recommended method, the remainder results in an extra sector pulse just before index. Some controllers, however, cannot accommodate the extra sector pulse. With the alternate method, there is no extra sector pulse. Descriptions of both methods follow.

Recommended Method for Sector Switch Settings

Refer to the subsystem reference manual to determine the number of sectors required by the controller. There is a choice of either 806 kHz or 1.2 MHz sector clock frequency (except that drives with BPEX or DPEX control boards do not have 1.2 MHz capability). See figure 3-19 for location of sector clock jumper, which determines sector clock frequency. Table 3-4

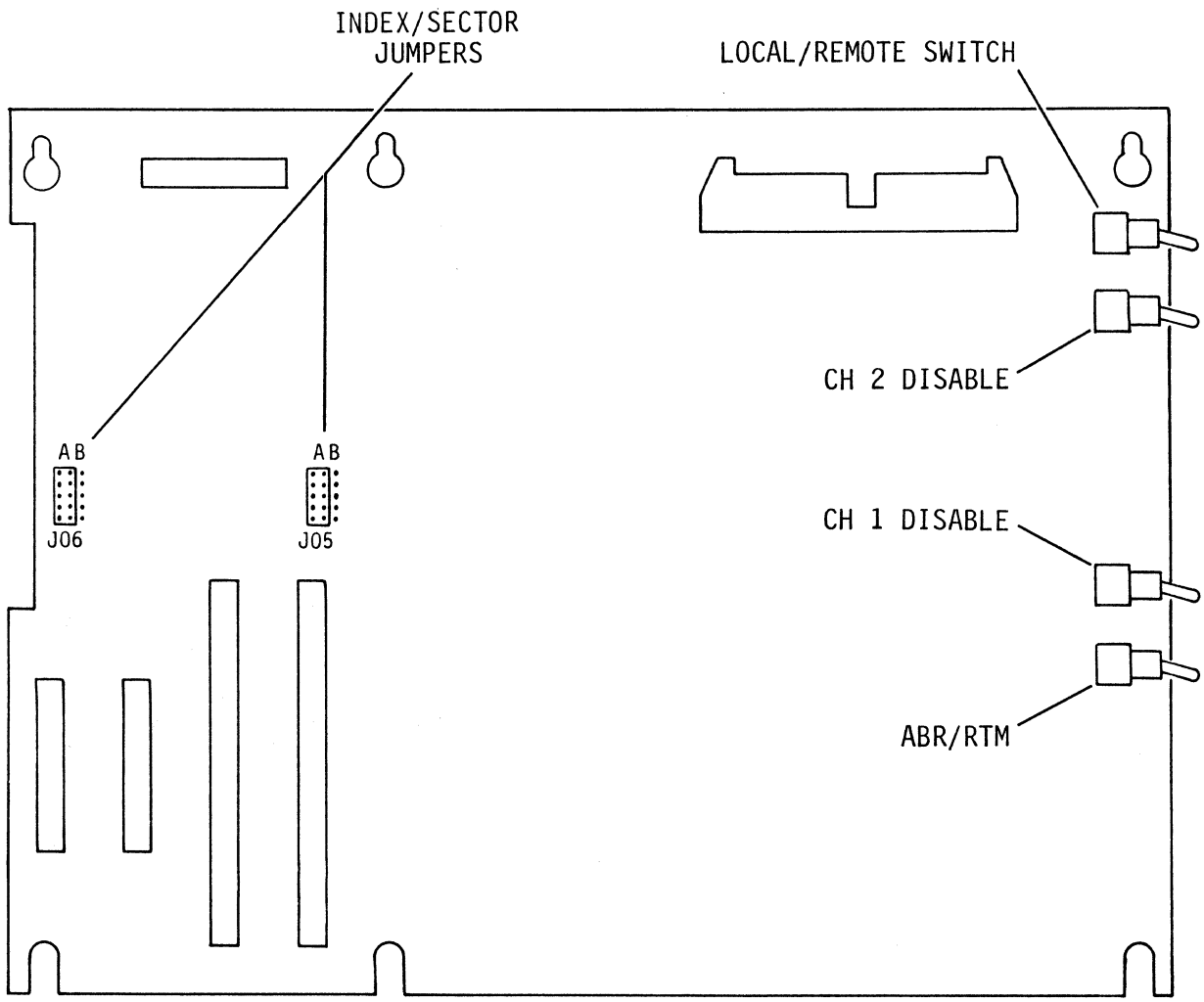


Figure 3-16. Switch Settings on AEDN/CEDN I/O Boards
(Sheet 1 of 2)

SWITCH	SETTING	DESCRIPTION
Index/Sector jumpers	A	Index and sector signals are in A cable.
	B	Index and sector signals are in B cable.
	Jumper removed	Index and sector signals are in A and B cables.
LOCAL/REMOTE	LOC	Drive powerup independent of controller.
	REM	Drive powerup dependent on controller.
CH 2	NORM	Setting for normal operation.
Disable	D1	
CH 1	NORM	Setting for normal operation.
Disable	D1	Disables channel 1.
ABR/RTM	ABR	Drive remains reserved until it receives release or priority select command.
	RTM	Drive is released from reserved condition approximately 500 ms after being selected.

Figure 3-16. Switch Settings on AEDN/CEDN I/O Boards (Sheet 2)

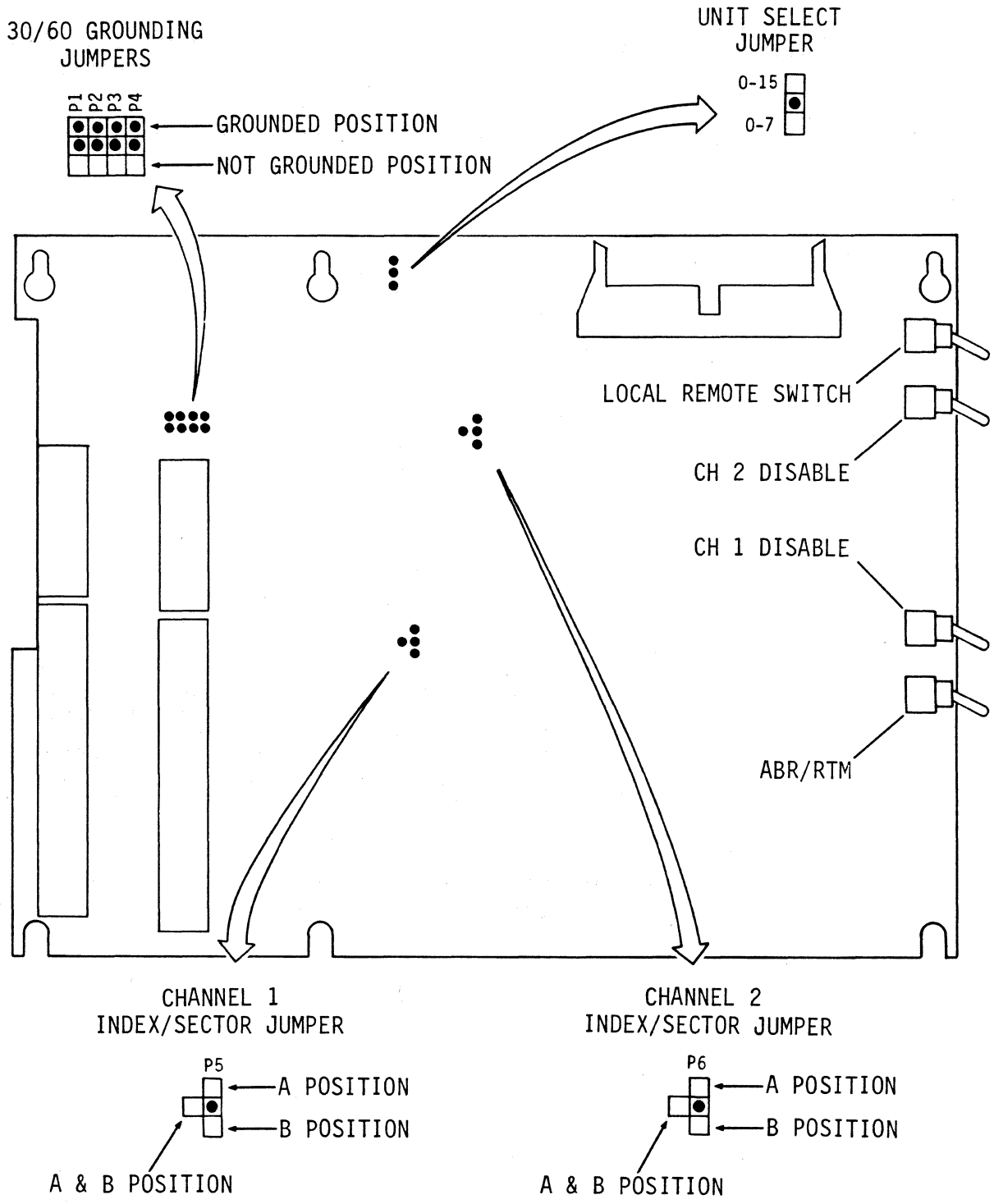
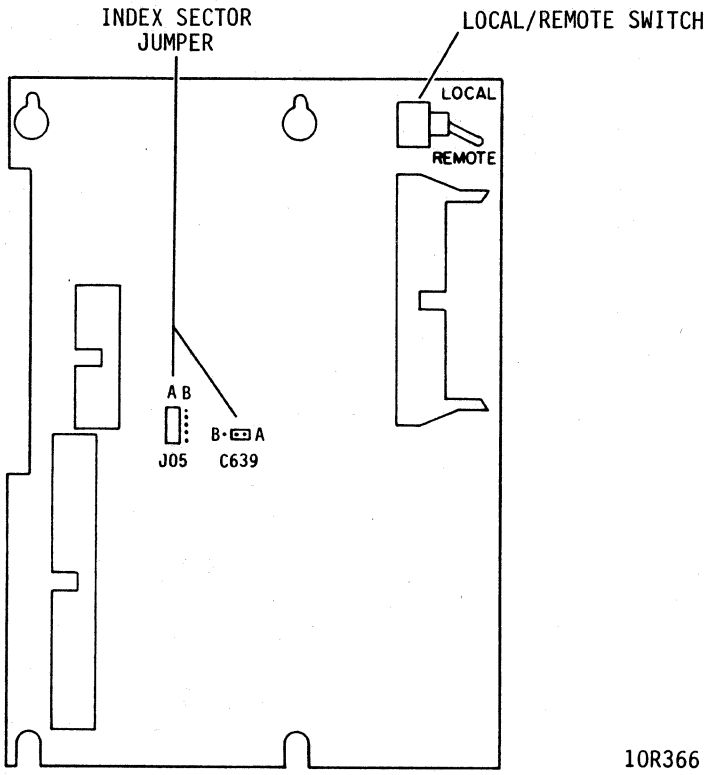


Figure 3-17. Switch Settings on DEDN I/O Board (Sheet 1 of 2)

SWITCH	SETTING	DESCRIPTION
30/60 Grounding Jumpers	P1 grounded	Pin 60 of Ch 2 A cable is grounded.
	P1 not grounded	Pin 60 of Ch 2 A cable is not grounded.
	P2 grounded	Pin 30 of Ch 2 A cable is grounded.
	P2 not grounded	Pin 30 of Ch 2 A cable is not grounded.
	P3 grounded	Pin 60 of Ch 1 A cable is grounded.
	P3 not grounded	Pin 60 of Ch 1 A cable is not grounded.
	P4 grounded	Pin 30 of Ch 1 A cable is grounded.
	P4 not grounded	Pin 30 of Ch 1 A cable is not grounded.
Unit Select Jumper	0-15	Capable of selecting drives numbered 0 thru 15.
	0-7	Capable of selecting drives numbered 0 thru 7.
Index/Sector Jumper	A	Index and sector signals are in A cable.
	B	Index and sector signals are in B cable.
	A & B	Index and sector signals are in A and B cables.
Local/Remote	LOC	Drive powerup independent of controller.
	REM	Drive powerup dependent on controller.
CH 2 Disable	NORM	Setting for normal operation.
	D1	Disables channel 2.
CH 1 Disable	NORM	Setting for normal operation.
	D1	Disables channel 1.
ABR/RTM	ABR	Drive remains reserved until it receives release or priority select command.
	RTM	Drive is released from reserved condition approximately 500 ms after being selected.

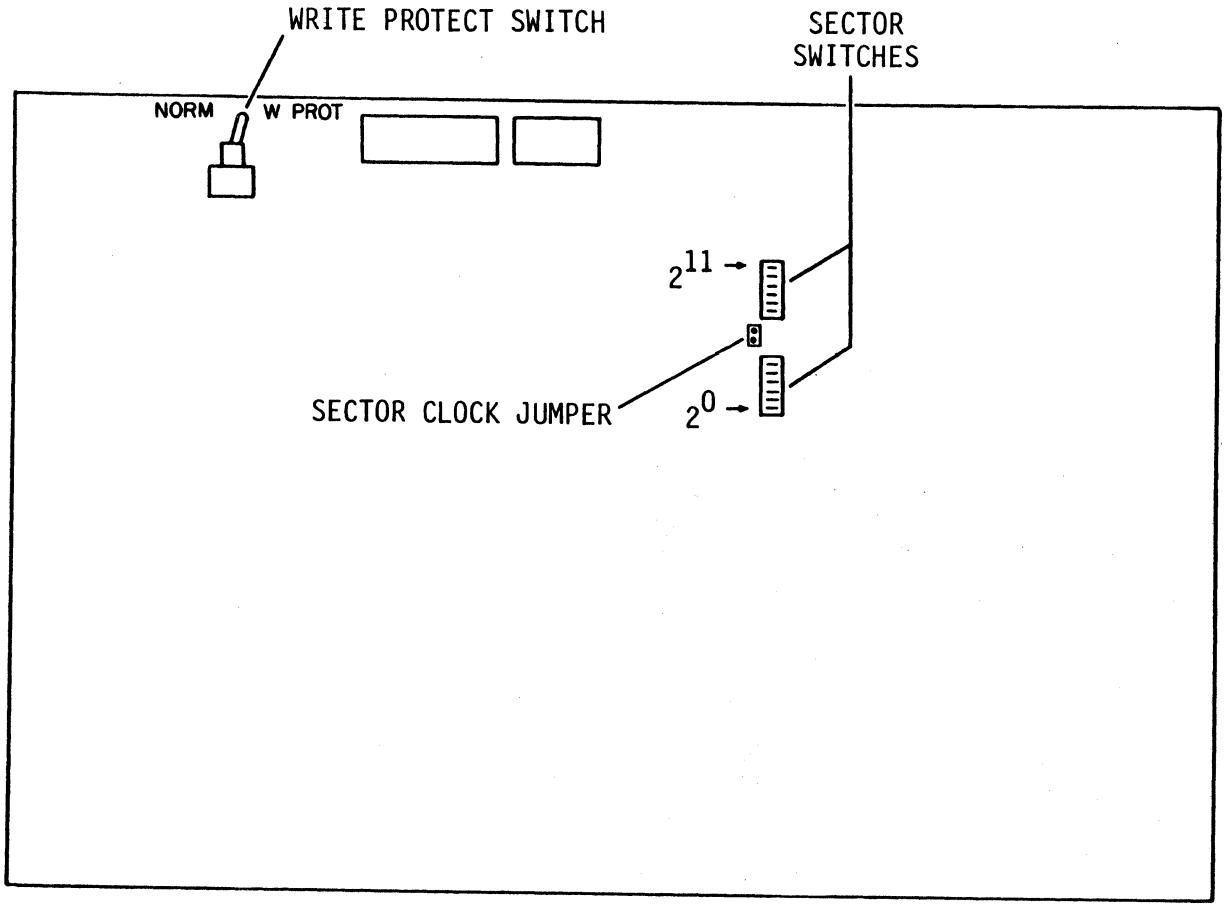
Figure 3-17. Switch Settings on DEDN I/O Board (Sheet 2)



SWITCH	SETTING	DESCRIPTION
LOCAL/REMOTE	LOCAL	Drive powerup independent of controller.
	REMOTE	Drive powerup dependent on controller.
Index/Sector jumper*	A	Index and sector signals are in A cable.
	B	Index and sector signals are in B cable.
	Jumper removed	Index and sector signals are in A and B cables (applies to newer boards only).

*Location J05 applies to older boards.
Location C639 applies to newer boards.

Figure 3-18. Switch Settings on _EBN I/O Board



SWITCH	SETTING	DESCRIPTION
Sector switches		See discussion on setting circuit board switches.
Write Protect	NORM	Normal.
	W PROT	Write Protect.
Sector Clock Jumper*	Jumper removed	Sector clock frequency is 806 KHz.
	Jumper installed	Sector clock frequency is 1.2 MHz.
*Older boards without jumper do not have 1.2 MHz capability.		

Figure 3-19. Switch Settings on _PEX Control Board

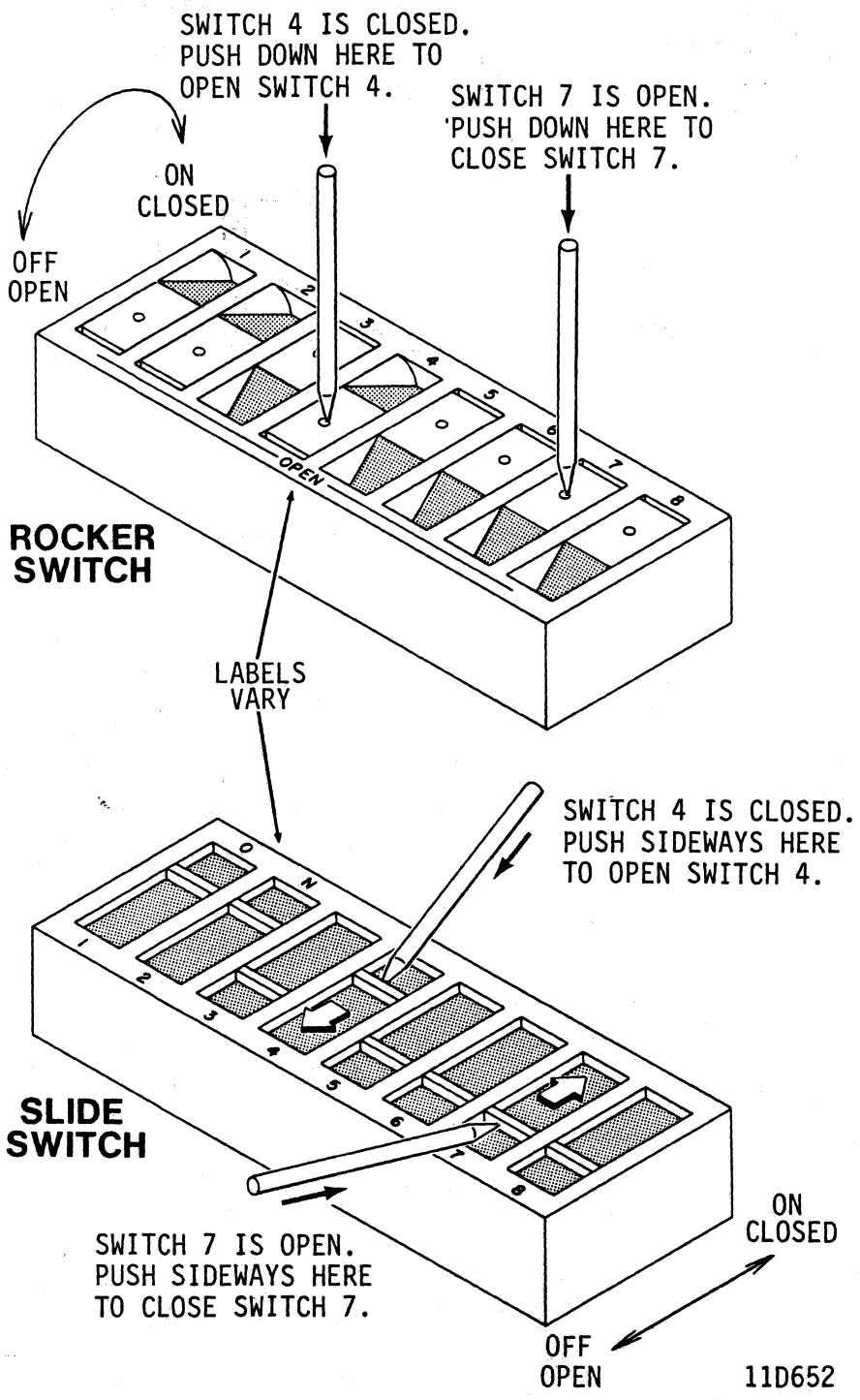


Figure 3-20. How to Set DIP Switches

shows sector switch settings for the 806 kHz sector clock. Across from the number of sectors listed in the table is a row of Cs and Os. C represents the Closed (On) position of the sector switch. O represents the Open (Off) position of the sector switch. Set the switches to the positions designated in the table while referring to figure 3-20 for an illustration of the switch positions.

The switch settings listed in table 3-4 have been determined from a formula. Use of this formula is demonstrated below to provide the user with an additional tool for determining sector switch settings. The text also provides a formula for setting sector switches for the 1.2 MHz Sector Clock. Examples showing how to calculate the number of bytes in a sector are also provided.

Each sector will contain a certain number of clock pulses (received from the servo tracks). The number of clock pulses in each sector is the result of the number of sectors required by the controller. Thus with an 806 kHz Sector Clock:

$$\text{Selected Clock Pulses} = \frac{13\ 440}{\text{Number of Sectors}} - 1$$

NOTE

Ignore any remainder in the calculation. The existence of a remainder adds a "short" sector before index.

Each sector switch represents a binary and decimal value of clock pulses (as counted in the logic). The values related to each switch are as follows:

Switch No.	Binary Value	Decimal Value
0	2^0	1
1	2^1	2
2	2^2	4
3	2^3	8
4	2^4	16
5	2^5	32
6	2^6	64
7	2^7	128
8	2^8	256
9	2^9	512
10	2^{10}	1024
11	2^{11}	2048

Here is an example of determining the switch settings for selecting 63 sectors (806 kHz Sector Clock):

$$\text{Selected Clock Pulses} = \left(\frac{13\ 440}{63} - 1\right) = (213.33 - 1) = 212.33$$

If there is a remainder it should be ignored. In this case, the number of selected pulses becomes 212.

Determine which switches to place in the Closed (On) position as follows:

Selected clock pulses	212
Clock pulses selected by switch 7	128
(Difference)	84
Clock pulses selected by switch 6	64
(Difference)	20
Clock pulses selected by switch 4	16
(Difference)	4
Clock pulses selected by switch 2	4
(Difference)	0

Thus, placing switches 2, 4, 6, and 7 in the Closed (On) position selects 63 sectors. Since a remainder existed in the calculation formula, an additional sector pulse will be present just before index.

To calculate the number of bytes in one sector, based on the above switch settings, proceed as follows:

- Add 1 to the selected clock pulses: 212 + 1 = 213.
- Multiply this number by the number of bytes per clock pulse (1.5) to find the number of bytes per sector: 213 X 1.5 = 319.5

The 1.2 MHz Sector Clock option increases by half the number of clock pulses per track (20 160). This clock allows the drive user an alternate formula for generating a specific number of sectors per track or bytes per sector. Here is an example of determining the switch settings for selecting 33 sectors with a 1.2 MHz Sector Clock:

$$\text{Selected Clock Pulses} = \left(\frac{20\ 160}{33} - 1\right) = (610.9 - 1) = 609.9$$

If there is a remainder, it should be ignored. In this case, the number of selected clock pulses becomes 609.

Determine which switches to place in the Closed (On) position as follows:

Selected clock pulses	609
Clock pulses selected by switch 9	512
(Difference)	97
Clock pulses selected by switch 6	64
(Difference)	33
Clock pulses selected by switch 5	32
(Difference)	1
Clock pulses selected by switch 0	1
(Difference)	0

Thus, placing switches 0, 5, 6, and 9 in the Closed (On) position selects 33 sectors. Since a remainder existed in the calculation formula, an additional sector pulse is present just before index.

To calculate the number of bytes in one sector, based on the above switch settings, proceed as follows:

- Add 1 to the selected clock pulses: 609 + 1 = 610.
- Multiply this number by the number of bytes per clock pulse (1.0) to find the number of bytes per sector: 610 X 1.0 = 610

Alternate Method for Sector Switch Settings

Use the following formula to determine sector switch settings if the subsystem cannot accept an extra sector pulse before index.

Here is an example of determining the switch settings for selecting 63 sectors (use 20 160 clock pulses if 1.2 MHz Sector Clock is selected):

$$\text{Selected Clock Pulses} = \left(\frac{13\ 440}{63} - 1\right) = (213.33 - 1) = 212.33$$

If there is a remainder, it is necessary to round up to the next whole number. In this case, the number of selected clock pulses becomes 213.

Determine which switches to place in the Closed (On) position as follows:

Selected clock pulses	213
Clock pulses selected by switch 7	128
(Difference)	85
Clock pulses selected by switch 6	64
(Difference)	21
Clock pulses selected by switch 4	16
(Difference)	5
Clock pulses selected by switch 2	4
(Difference)	1
Clock pulses selected by switch 0	1
(Difference)	0

Thus, placing switches 0, 2, 4, 6, and 7 in the Closed (On) position selects 63 sectors. Since a remainder existed in the calculation formula, the last (63rd) sector will be shorter than those preceding it.

To calculate the number of bytes in each of the first 62 sectors, based on the above switch settings, proceed as follows:

- Add 1 to the selected clock pulses: 213 + 1 = 214
- Multiply this number by the number of bytes per clock pulse (1.5) to find the number of bytes per sector: 214 X 1.5 = 321.0

To calculate the number of bytes in the 63rd sector proceed as follows:

- Multiply the number of bytes per sector (calculated above) by 62 (the number of full-length sectors): 321 X 62 = 19 902
- Subtract this number from the number of bytes per track (20 160) to find the number of bytes in the 63rd sector: 20 160 - 19 902 = 258

TABLE 3-4. SECTOR SELECT SWITCH SETTINGS - 806 kHz

Number of Sectors	Switch Number											
	0	1	2	3	4	5	6	7	8	9	10	11
4	C	C	C	C	C	O	O	O	C	O	C	C
5	C	C	C	C	C	C	C	O	O	C	O	C
6	C	C	C	C	C	C	O	C	O	O	O	C
7	C	C	C	C	C	C	C	O	C	C	C	O
8	C	C	C	C	O	O	O	C	O	C	C	O
9	O	O	C	O	C	O	C	C	C	O	C	O
10	C	C	C	C	C	C	O	O	C	O	C	O
11	O	O	C	O	O	O	C	C	O	O	C	O
12	C	C	C	C	C	O	C	O	O	O	C	O
13	O	O	O	C	O	O	O	O	O	O	C	O
14	C	C	C	C	C	C	O	C	C	C	O	O
15	C	C	C	C	C	C	C	O	C	C	O	O
16	C	C	C	O	O	O	C	O	C	C	O	O
17	C	O	C	O	C	O	O	O	C	C	O	O
18	C	O	O	C	O	C	C	C	O	C	O	O
19	O	C	O	O	O	O	C	C	O	C	O	O
20	C	C	C	C	C	O	O	C	O	C	O	O
21	C	C	C	C	C	C	C	O	O	C	O	O
22	C	O	O	O	O	C	C	O	O	C	O	O
23	C	C	C	O	O	O	C	O	O	C	O	O
24	C	C	C	C	O	C	O	O	O	C	O	O
25	O	O	O	C	C	O	O	O	O	C	O	O
26	C	C	O	O	O	O	O	O	O	C	O	O
27	O	O	O	O	C	C	C	C	C	O	O	O
28	C	C	C	C	C	O	C	C	C	O	O	O

Table Continued on Next Page

TABLE 3-4. SECTOR SELECT SWITCH SETTINGS - 806 kHz (Contd)

Number of Sectors	Switch Number											
	0	1	2	3	4	5	6	7	8	9	10	11
29	O	C	C	C	O	O	C	C	C	O	O	O
30	C	C	C	C	C	C	O	C	C	O	O	O
31	O	O	O	O	C	C	O	C	C	O	O	O
32	C	C	O	O	O	C	O	C	C	O	O	O
33	O	C	C	O	C	O	O	C	C	O	O	O
34	O	C	O	C	O	O	O	C	C	O	O	O
35	C	C	C	C	C	C	C	O	C	O	O	O
36	O	O	C	O	C	C	C	O	C	O	O	O
37	O	C	O	C	O	C	C	O	C	O	O	O
38	O	O	O	O	O	C	C	O	C	O	O	O
39	C	C	C	O	C	O	C	O	C	O	O	O
40	C	C	C	C	O	O	C	O	C	O	O	O
41	O	C	C	O	O	O	C	O	C	O	O	O
42	C	C	C	C	C	C	O	O	C	O	O	O
43	C	C	C	O	C	C	O	O	C	O	O	O
44	O	O	O	O	C	C	O	O	C	O	O	O
45	C	O	O	C	O	C	O	O	C	O	O	O
46	C	C	O	O	O	C	O	O	C	O	O	O
47	O	O	C	C	C	O	O	O	C	O	O	O
48	C	C	C	O	C	O	O	O	C	O	O	O
49	C	O	O	O	C	O	O	O	C	O	O	O
50	C	C	O	C	O	O	O	O	C	O	O	O
51	O	C	C	O	O	O	O	O	C	O	O	O
52	C	O	O	O	O	O	O	O	C	O	O	O
53	O	O	C	C	C	C	C	C	O	O	O	O

Table Continued on Next Page

TABLE 3-4. SECTOR SELECT SWITCH SETTINGS - 806 kHz (Contd)

Number of Sectors	Switch Number											
	0	1	2	3	4	5	6	7	8	9	10	11
54	C	C	C	O	C	C	C	C	O	O	O	O
55	C	C	O	O	C	C	C	C	O	O	O	O
56	C	C	C	C	O	C	C	C	O	O	O	O
57	O	C	O	C	O	C	C	C	O	O	O	O
58	O	C	C	O	O	C	C	C	O	O	O	O
59	O	C	O	O	O	C	C	C	O	O	O	O
60	C	C	C	C	C	O	C	C	O	O	O	O
61	C	C	O	C	C	O	C	C	O	O	O	O
62	C	C	C	O	C	O	C	C	O	O	O	O
63	O	O	C	O	C	O	C	C	O	O	O	O
64	C	O	O	O	C	O	C	C	O	O	O	O
65	C	O	C	C	O	O	C	C	O	O	O	O
66	O	C	O	C	O	O	C	C	O	O	O	O
67	C	C	C	O	O	O	C	C	O	O	O	O
68	O	O	C	O	O	O	C	C	O	O	O	O
69	C	O	O	O	O	O	C	C	O	O	O	O
70	C	C	C	C	C	C	O	C	O	O	O	O
71	O	O	C	C	C	C	O	C	O	O	O	O
72	C	O	O	C	C	C	O	C	O	O	O	O
73	C	C	C	O	C	C	O	C	O	O	O	O
74	O	O	C	O	C	C	O	C	O	O	O	O
75	O	C	O	O	C	C	O	C	O	O	O	O
76	C	C	C	C	O	C	O	C	O	O	O	O
77	C	O	C	C	O	C	O	C	O	O	O	O
78	C	C	O	C	O	C	O	C	O	O	O	O

Table Continued on Next Page

TABLE 3-4. SECTOR SELECT SWITCH SETTINGS - 806 kHz (Contd)

Number of Sectors	Switch Number											
	0	1	2	3	4	5	6	7	8	9	10	11
79	C	O	O	C	O	C	O	C	O	O	O	O
80	C	C	C	O	O	C	O	C	O	O	O	O
81	O	O	C	O	O	C	O	C	O	O	O	O
82	O	C	O	O	O	C	O	C	O	O	O	O
83	O	O	O	O	O	C	O	C	O	O	O	O
84	C	C	C	C	C	O	O	C	O	O	O	O
85	C	O	C	C	C	O	O	C	O	O	O	O
86	C	C	O	C	C	O	O	C	O	O	O	O
87	C	O	O	C	C	O	O	C	O	O	O	O
88	C	C	C	O	C	O	O	C	O	O	O	O
89	O	C	C	O	C	O	O	C	O	O	O	O
90	O	O	C	O	C	O	O	C	O	O	O	O
91	O	C	O	O	C	O	O	C	O	O	O	O
92	C	O	O	O	C	O	O	C	O	O	O	O
93	C	C	C	C	O	O	O	C	O	O	O	O
94	C	O	C	C	O	O	O	C	O	O	O	O
95	O	O	C	C	O	O	O	C	O	O	O	O
96	C	C	O	C	O	O	O	C	O	O	O	O
97	C	O	O	C	O	O	O	C	O	O	O	O
98	O	O	O	C	O	O	O	C	O	O	O	O
99	O	C	C	O	O	O	O	C	O	O	O	O
100	C	O	C	O	O	O	O	C	O	O	O	O
101	O	O	C	O	O	O	O	C	O	O	O	O
102	O	C	O	O	O	O	O	C	O	O	O	O
103	C	O	O	O	O	O	O	C	O	O	O	O

Table Continued on Next Page

TABLE 3-4. SECTOR SELECT SWITCH SETTINGS - 806 kHz (Contd)

Number of Sectors	Switch Number											
	0	1	2	3	4	5	6	7	8	9	10	11
104	O	O	O	O	O	O	O	C	O	O	O	O
105	C	C	C	C	C	C	C	O	O	O	O	O
106	C	O	C	C	C	C	C	O	O	O	O	O
107	O	O	C	C	C	C	C	O	O	O	O	O
108	C	C	O	C	C	C	C	O	O	O	O	O
109	O	C	O	C	C	C	C	O	O	O	O	O
110	C	O	O	C	C	C	C	O	O	O	O	O
111	O	O	O	C	C	C	C	O	O	O	O	O
112	C	C	C	O	C	C	C	O	O	O	O	O
113	C	O	C	O	C	C	C	O	O	O	O	O
114	O	O	C	O	C	C	C	O	O	O	O	O
115	C	C	O	O	C	C	C	O	O	O	O	O
116	O	C	O	O	C	C	C	O	O	O	O	O
117	C	O	O	O	C	C	C	O	O	O	O	O
118	O	O	O	O	C	C	C	O	O	O	O	O
119	C	C	C	C	O	C	C	O	O	O	O	O
120	C	C	C	C	O	C	C	O	O	O	O	O
121	O	C	C	C	O	C	C	O	O	O	O	O
122	C	O	C	C	O	C	C	O	O	O	O	O
123	O	O	C	C	O	C	C	O	O	O	O	O
124	C	C	O	C	O	C	C	O	O	O	O	O
125	O	C	O	C	O	C	C	O	O	O	O	O
126	C	O	O	C	O	C	C	O	O	O	O	O
127	O	O	O	C	O	C	C	O	O	O	O	O
128	O	O	O	C	O	C	C	O	O	O	O	O

Note: C = Closed (On) position; O = Open (Off) position.

CHECKOUT

After completing installation of the drive, follow the sequence outlined below for initial startup. Refer to section 2 of this manual for information about operation of the drive.

1. Install logic plug in operator panel. Logic plug for each drive in a system must have a unique number.

2. Set LOCAL/REMOTE switch to LOCAL position. Switch is accessible through opening in left side of cover.

3. Set power supply switch/circuit breaker in ON position, and observe that the drive cooling fan operates.

4. Install a data pack in drive (see operation section of this manual), press START switch on drive operator panel, and observe that the following events occur:

   - The drive motor starts.

   - The Ready indicator (inside the START switch) lights steadily within 60 seconds of startup. This indicates that the drive motor is up to speed and that the heads are at track 0.

   If any of these events do not occur, a problem exists in the drive. Then refer to troubleshooting information in volume 2 of the hardware maintenance manual.

5. Power down drive.

6. Set LOCAL/REMOTE switch to REMOTE position if remote operation is desired.

7. Return drive to normal operating position in equipment rack.

8. Drive is now ready for on line operation.

SECTION 4

PARTS DATA

INTRODUCTION

This section contains listings of field replaceable parts (including FRUs), manufacturer's recommended spare parts, and accessories. Use only Imprimis replacement parts. Using non-Imprimis replacement parts can adversely affect safety. Using other manufacturers' parts could also degrade reliability, increase maintenance downtime, and void warranty coverage.

NOTE

ORDER AND REPLACE LOGIC BOARDS BY PART NUMBER ONLY.

Logic boards have an alpha card type designator stamped on them. In the past, ECOs that changed a board part number also changed the first letter of the designator (AWXY to BWXY). Effective 1 August 1987, only the part number changes. The card type does not change.

FIELD REPLACEABLE PARTS LIST

This listing is divided into four columns:

- INDEX NO - The numbers in this column correspond to the numbers shown within the facing page illustration.

- PART NUMBER - Contains one of the following:

  1. Eight digit part number - use this number to order a replacement part. Within the continental U.S., parts may be ordered from:

     Imprimis Technology Incorporated
     Customer Services
     5950 Clearwater Drive
     Minnetonka, MN 55343

     Phone: 1-800-382-6060
     Fax: (612) 931-8817

  2. Optional - parts which are not used in all applications. To determine usage in a particular equipment, you must first know the Equipment Package part number

(refer to Equipment Configuration in section 1 of this manual for definition and location of this number) and then refer to table 4-1. Table 4-1 contains the Equipment Package part number (the first 6 digits are on line 1, and the last 2 digits are on line 2) and a list of optional parts. If an optional part is used in a particular Equipment Package, "XX" will appear in that column.

3. Spare - indicates that the item is a manufacturer's recommended spare part. Refer to table 4-2 for replacement part number information.

- PART DESCRIPTION - Contains part nomenclature/description. If an item is indented more than the previous item, it indicates it is part of the previous item (assembly).

- NOTE - Usually contains entries to define differences between machine configurations (i.e., model differences, older units vs newer units, etc.).

MANUFACTURER'S RECOMMENDED SPARE PARTS

This listing (table 4-2) is divided into three columns:

- DESCRIPTION/NOTES - Contains the part nomenclature/description and other pertinent information.

- PART NUMBER - Contains the part number of the part when the unit was manufactured or as a result of the latest FCO. This part can be used as a replacement on the series code and types of units indicated in the Description/Notes column. However, always use Replacement Part Number when ordering new parts or spares.

- REPLACEMENT PART NUMBER - Contains the interchangeable replacement part number. Use this number for ordering replacement or spare parts.

ACCESSORIES

This listing (table 4-3) contains the following:

- PART NUMBER - Use this number to order this part. See Field Replaceable Parts List for ordering information.

- DESCRIPTION - Contains the part nomenclature/description.

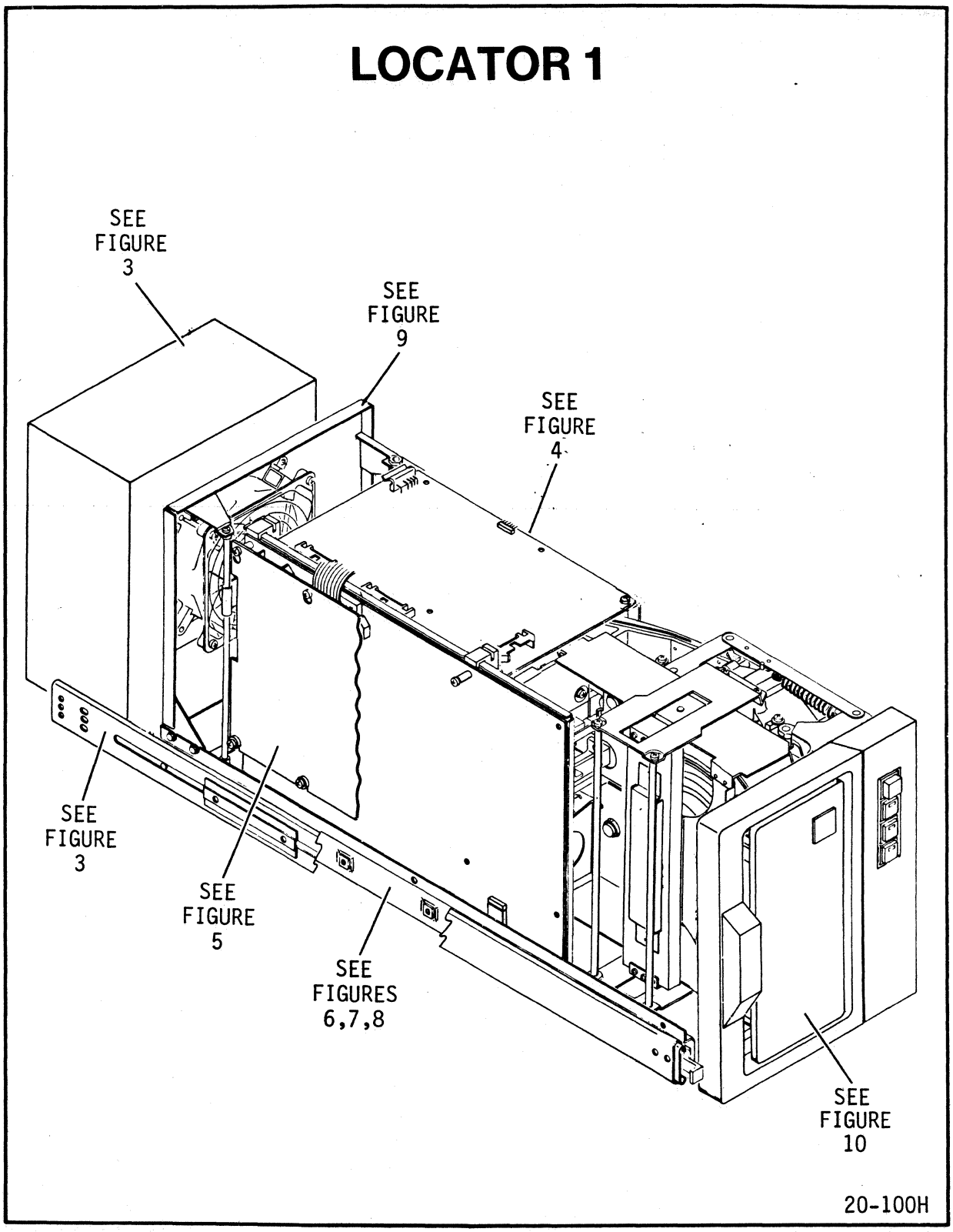

LOCATOR 1
SEE FIGURE 3
SEE FIGURE 9
SEE FIGURE 4
SEE FIGURE 3
SEE FIGURE 5
SEE FIGURES 6,7,8
SEE FIGURE 10
20-100H

Figure 4-1

LOCATOR 2

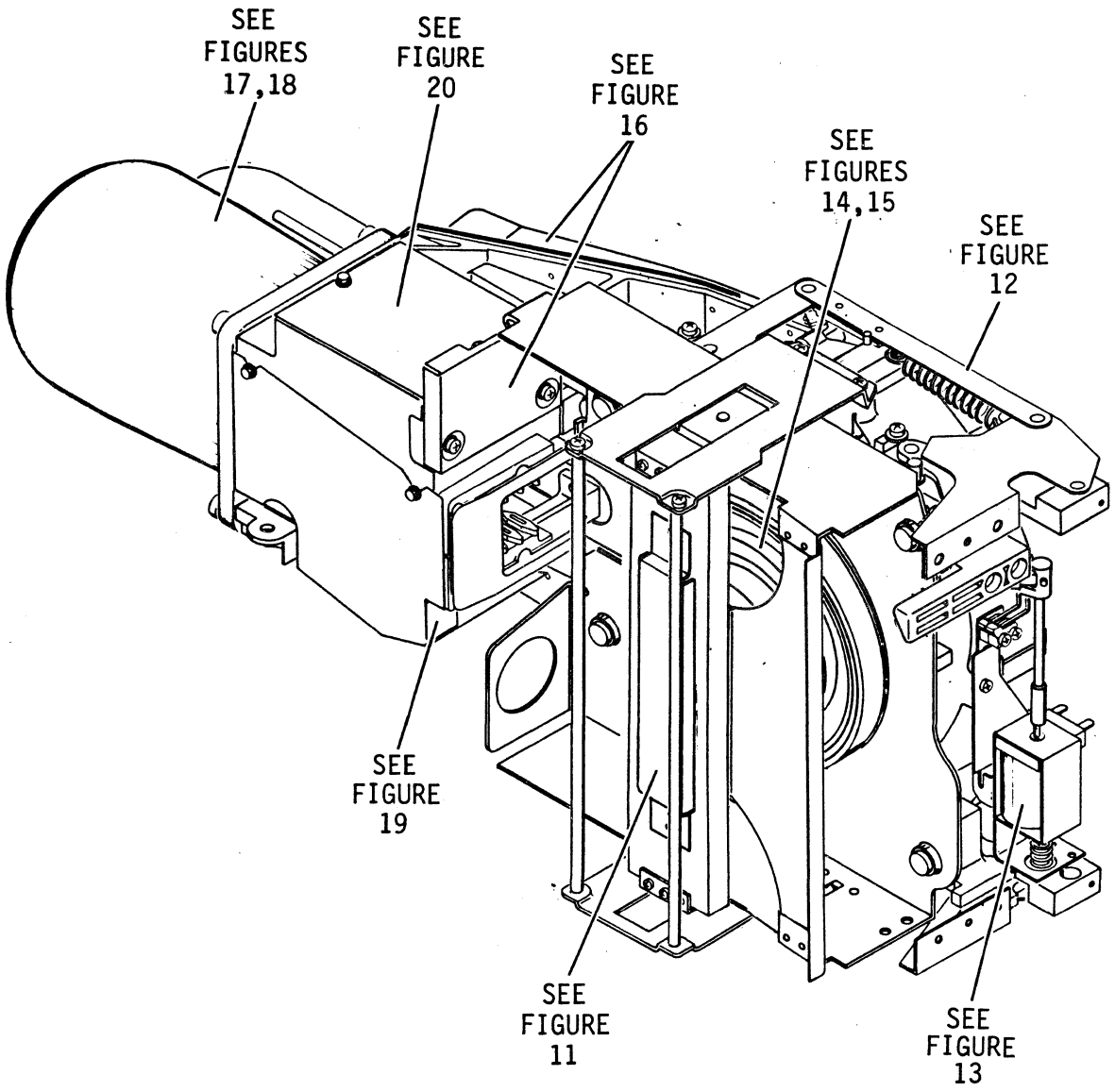


Figure 4-2

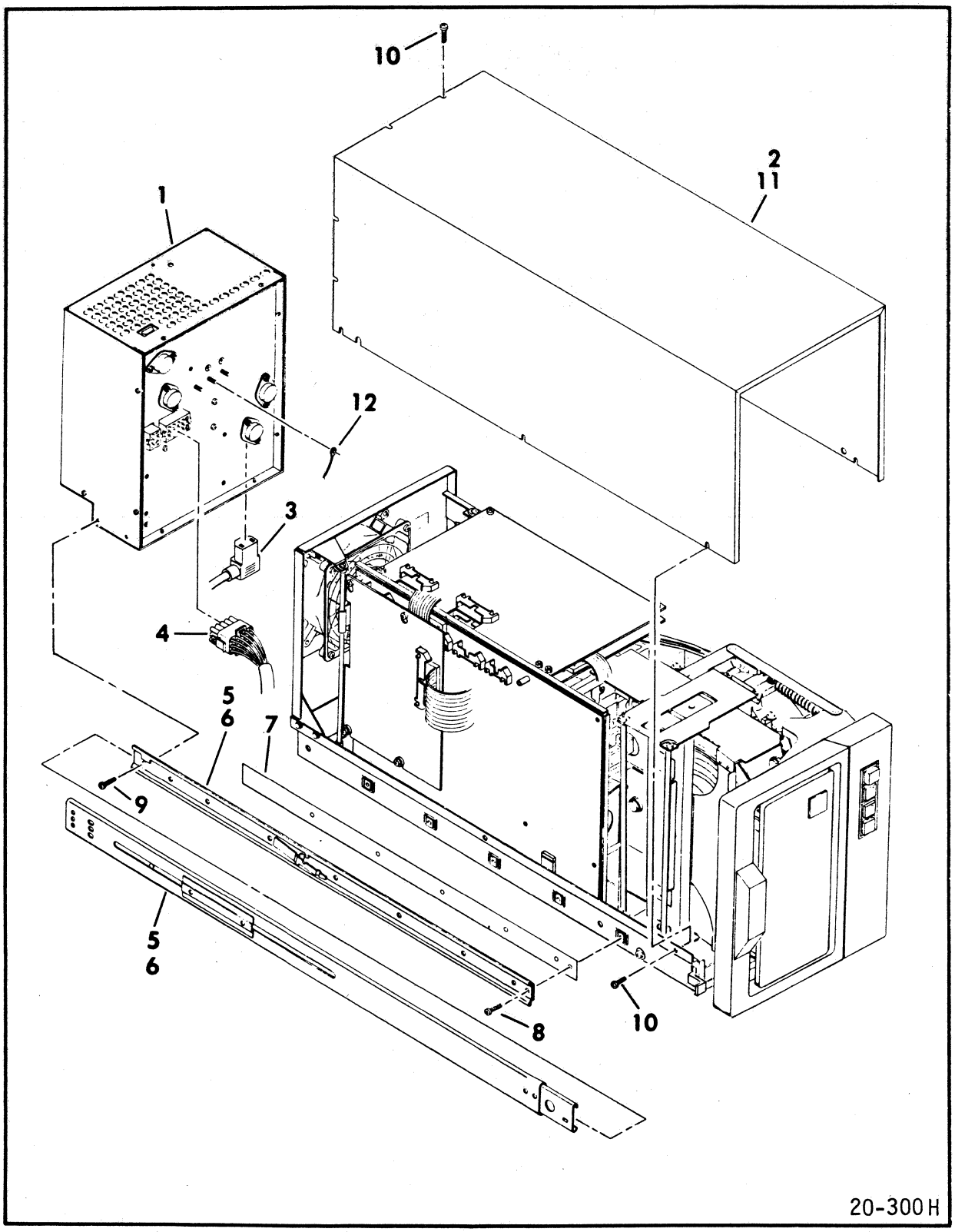


Figure 4-3 (Units With Slide-Mounted Remote Power Supply)

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	Spare	POWER SUPPLY ASSEMBLY, Remote	
2	77425210	COVER, Top	
3	Optional	AC POWER CABLE (P01)	
4	Optional	DC POWER CABLE (P15/P40)	
5	Optional	SLIDE ASSEMBLY, LH	
6	Optional	SLIDE ASSEMBLY, RH	
7	93263420	INSULATOR, Slide	
8	94375825	SCREW, PHH, 8-16 x 1/2	
9	17901517	SCREW, PHH, 8-32 x 1/2	
10	92743158	SCREW, PHH, 6-32 x 1/4	
11	95138400	PLUG, Access Hole, Top Cover	
12	Optional	GROUND CABLE	

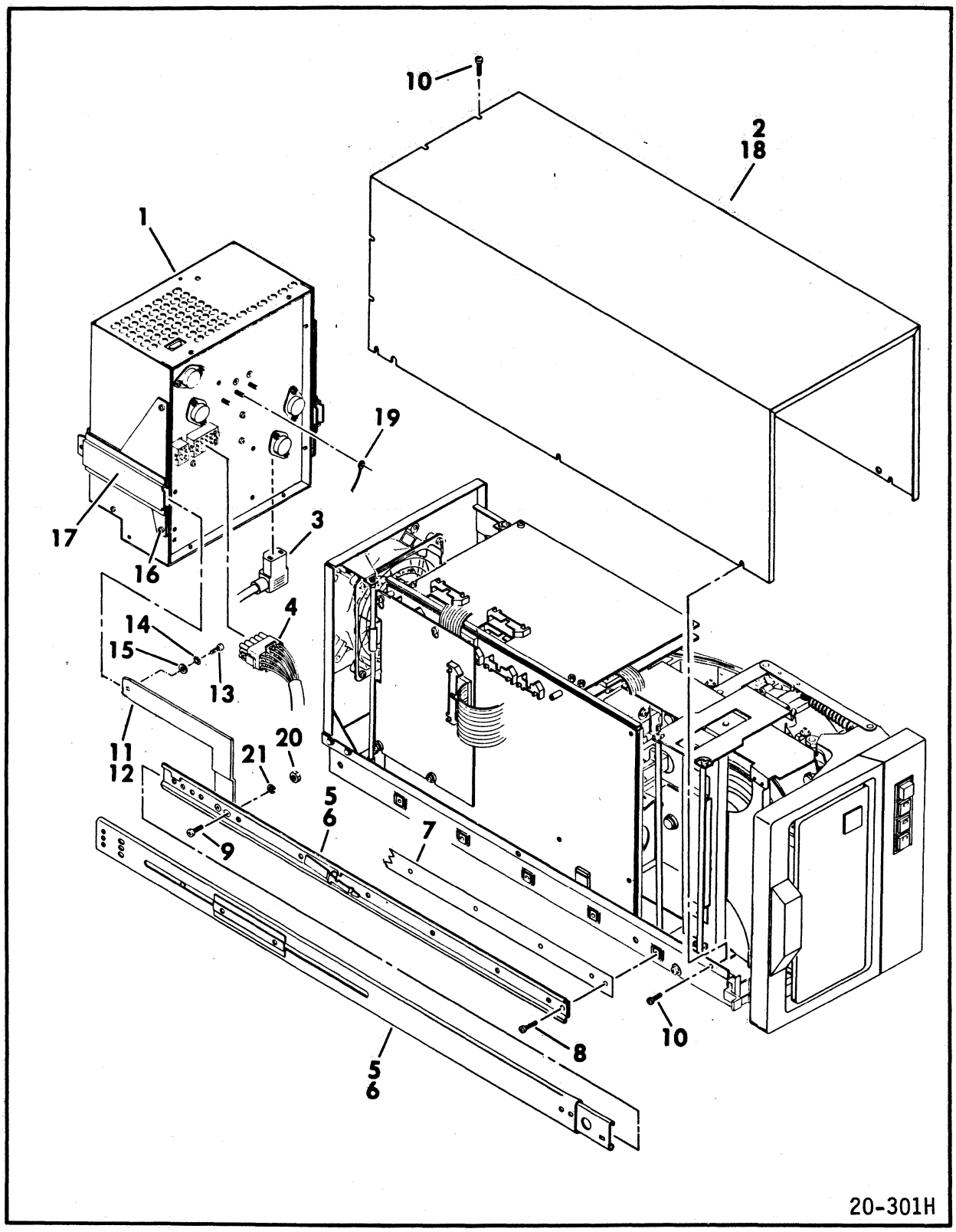


Figure 4-3 (Units With Bracket-Mounted Remote Power Supply)

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	Spare	POWER SUPPLY ASSEMBLY, Remote	
2	77425210	COVER, Top	
3	Optional	AC POWER CABLE (P01)	
4	Optional	DC POWER CABLE (P15/P40)	
5	Optional	SLIDE ASSEMBLY, LH	
6	Optional	SLIDE ASSEMBLY, RH	
7	93263420	INSULATOR, Slide	
8	94375825	SCREW, PHH, 8-16 x 1/2	
9	92905077	SCREW, PHH, 8-32 x 1/2	
10	92743158	SCREW, PHH, 6-32 x 1/4	
11	Optional	MOUNT, LH	
12	Optional	MOUNT, RH	
13	10127121	SCREW, PHH, 8-32 x 5/16	
14	10126402	LOCKWASHER, #8	
15	10125606	WASHER, #8	
16	17901509	SCREW, PHH, 6-32 x 3/8	
17	Optional	BRACKET, Mounting	
18	95138400	PLUG, Access Hole, Top Cover	
19	Optional	GROUND CABLE	
20	10125106	NUT, 8-32	
21	10125804	LOCKWASHER, #8	
	Optional	DRIVE MOUNTING KIT	
	Optional	FRONT FILLER PANEL KIT	

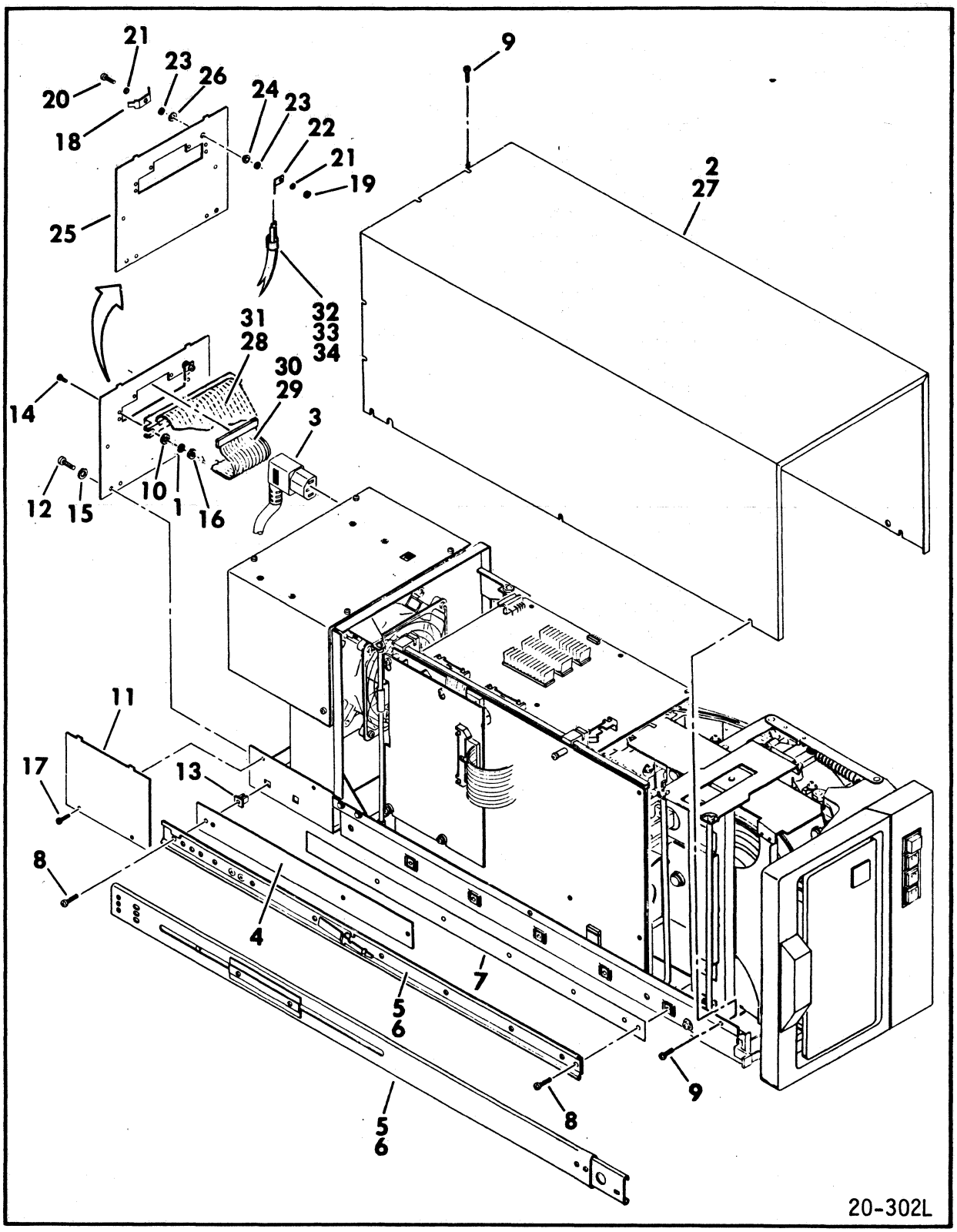


Figure 4-3 (Units With Integral Power Supply)

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	10125801	LOCKWASHER, #4	
2	77425210	COVER, Top	
3	Optional	AC POWER CABLE (P01)	240 V, 60 Hz
4	93265870	BRACKET, Shipping	
5	Optional	SLIDE ASSEMBLY, LH	
6	Optional	SLIDE ASSEMBLY, RH	
7	93263420	INSULATOR, Slide	
8	94375825	SCREW, PHH, 8-16 x 1/2	
9	92743158	SCREW, PHH, 6-32 x 1/4	
10	10125603	WASHER, #4	
11	76376370	PLATE, Cover	See Note 1
11	76376371	PLATE, Cover	See Note 2
12	17901508	SCREW, PHH, 6-32 x 1/4	See Note 1
12	10127121	SCREW, PHH, 8-32 x 5/16	See Note 2
13	72854290	NUT, Square	
14	92743088	SCREW, PHH, 4-40 x 1/2	
15	10125606	WASHER, #8	
16	10125103	NUT, Hex, 4-40	
17	92001710	SCREW W/WASHER, 6-32 x 5/16	
18	94274116	TERMINAL	
19	95510030	NUT, Hex, 6-32	
20	92751164	SCREW, PHH, 6-32 x 1/2	
21	95524401	LOCKWASHER, #6	
22	94274104	TERMINAL	
23	94047078	WASHER, Special	
24	95643808	WASHER, Insulated	
25	72855611	PLATE, I/O (Single Ch)	See Note 1
25	95131791	PLATE, I/O (Single Ch)	See Note 2
25	72855612	PLATE, I/O (Dual Ch)	See Note 1
25	95131792	PLATE, I/O (Dual Ch)	See Note 2
26	95797301	WASHER, Phenolic	
27	95138400	PLUG, Access Hole, Top Cover	
28	92439611	A CABLE, Int (Single Ch)	
28	92439613	A CABLE, Int (Dual Ch, Ch 1)	See Note 3
28	92439612	A CABLE, Int (Dual Ch, Ch 2)	See Note 3
29	92246310	B CABLE, Int (Single Ch)	
29	92246313	B CABLE, Int (Dual Ch, Ch 1)	See Note 3
29	92246312	B CABLE, Int (Dual Ch, Ch 2)	See Note 3
30	77431008	STRAIN RELIEF, B Cable	
31	77431010	STRAIN RELIEF, A Cable	
32	76376380	GROUND CABLE	See Note 1
32	76376381	GROUND CABLE	See Note 2
33	10126403	LOCKWASHER, #10	See Note 1
34	10125108	NUT, Hex, #10-32	See Note 2

Note 1: Used on longer type (p/n 81542300) power supply.
Note 2: Used on shorter type power supplies.
Note 3: Not used on CEDN boards.

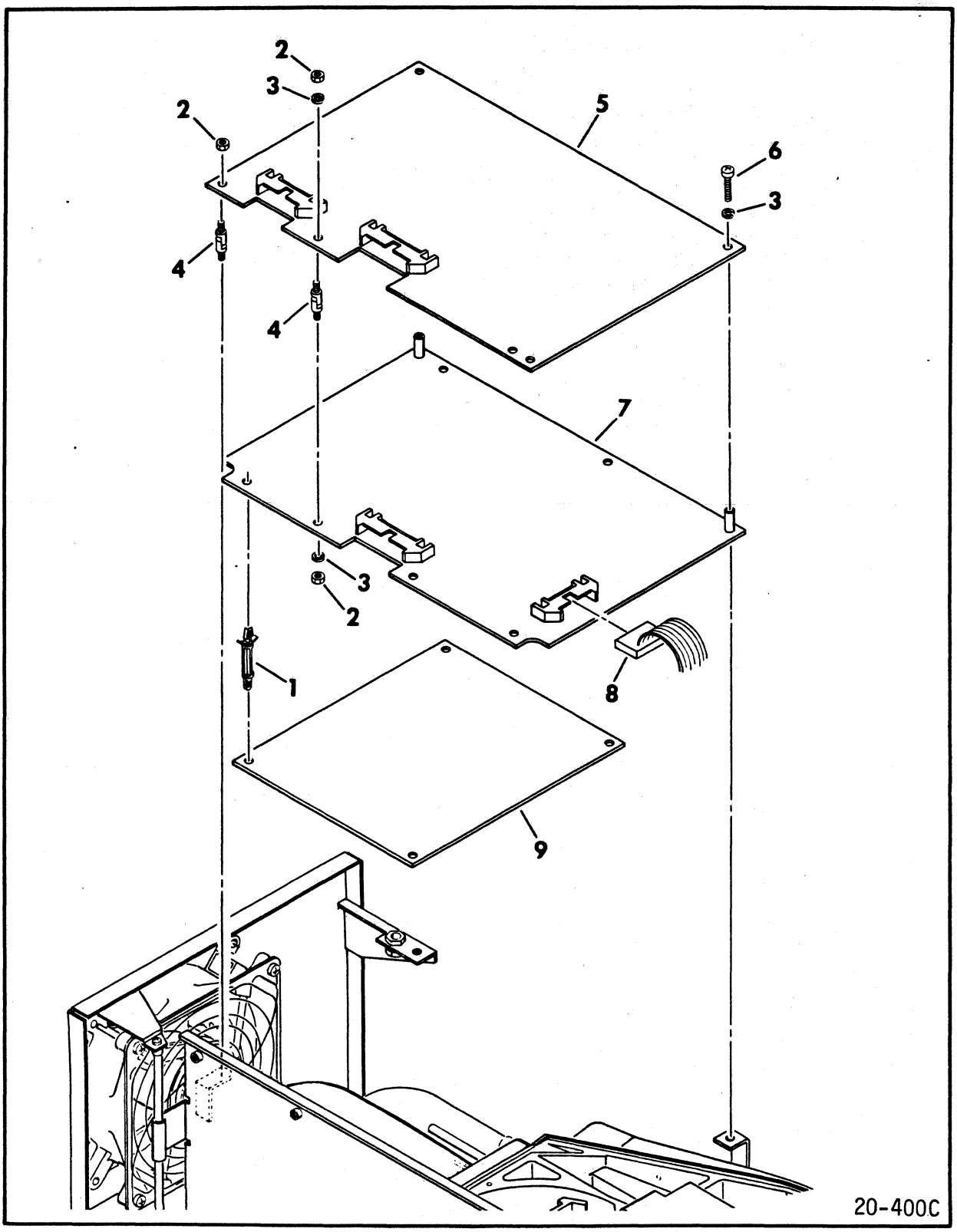


Figure 4-4 (Drives With 2-Board Read/Write)

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	94378801	SUPPORT, Circuit Board	
2	10125105	NUT, Hex, 6-32	
3	10125803	LOCKWASHER, #6	
4	47402261	STANDOFF, Hinged	
5	Spare	READ/WRITE PLO (_PGX) BOARD	
6	10127117	SCREW, PHH, 6-32 x 7/8	
7	Spare	DATA LATCH (_PFX) BOARD	
8	92049804	READ/WRITE PREAMP CABLE ASSY	
9	Spare	POWER AMP BOARD	

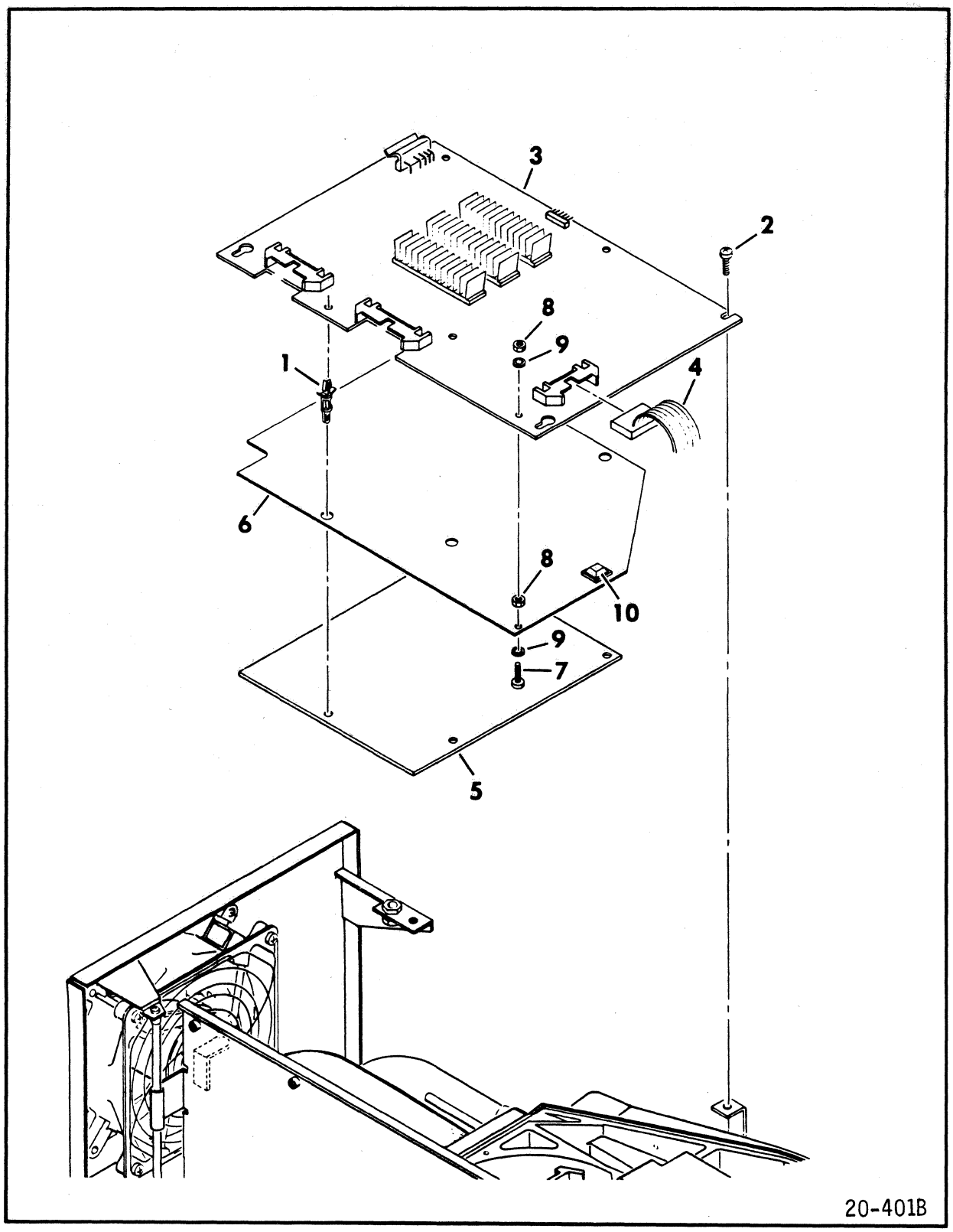


Figure 4-4 (Drives With 1-Board Read/Write)

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	46455330	SUPPORT, Circuit Board	
2	10127112	SCREW, PHH, 6-32 x 5/16	
3	Spare	R/W PLO AND DATA LATCH (_RUX) BOARD	
4	92049804	READ/WRITE PREAMP CABLE ASSY	
5	Spare	POWER AMP BOARD	
6	47039950	SHIELD	See Note 1
7	10127114	SCREW, PHH, 6-32 x 1/2	See Note 1
8	10125105	NUT, Hex, 6-32	See Note 1
9	10126103	LOCKWASHER, #6	See Note 1
10	51805802	BUMPER	See Note 1

Note 1: Used on series code 22 and above units.

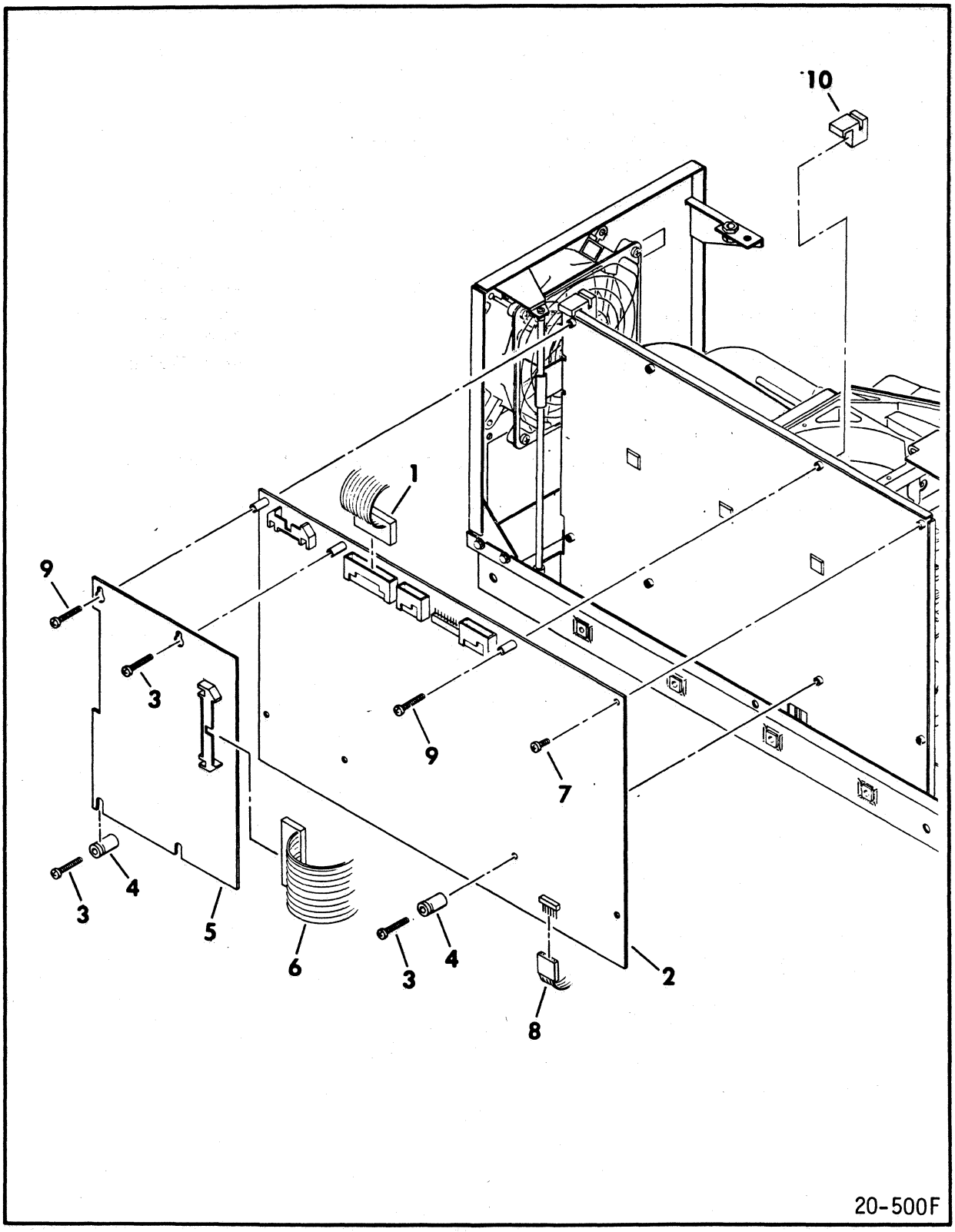


Figure 4-5

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	93458300	CABLE ASSEMBLY (P29/P30/P31)	See Note 1
1	93458302	CABLE ASSEMBLY (P29/P30)	See Note 2
2	Spare	CONTROL BOARD	
3	10127117	SCREW, PHH, 6-32 x 7/8	
4	92555237	STANDOFF	
5	Spare	I/O BOARD	
6	Spare	CABLE ASSEMBLY (P14/P20)	
7	10127111	SCREW, PHH, 6-32 x 1/4	
8	Spare	CABLE ASSEMBLY (P28/P34)	
9	10127118	SCREW, PHH, 6-32 x 1	
10	46455331	SUPPORT, R/W Board	See Note 2

Note 1: Used on drives with 2-board read/write.
Note 2: Used on drives with 1-board read/write.

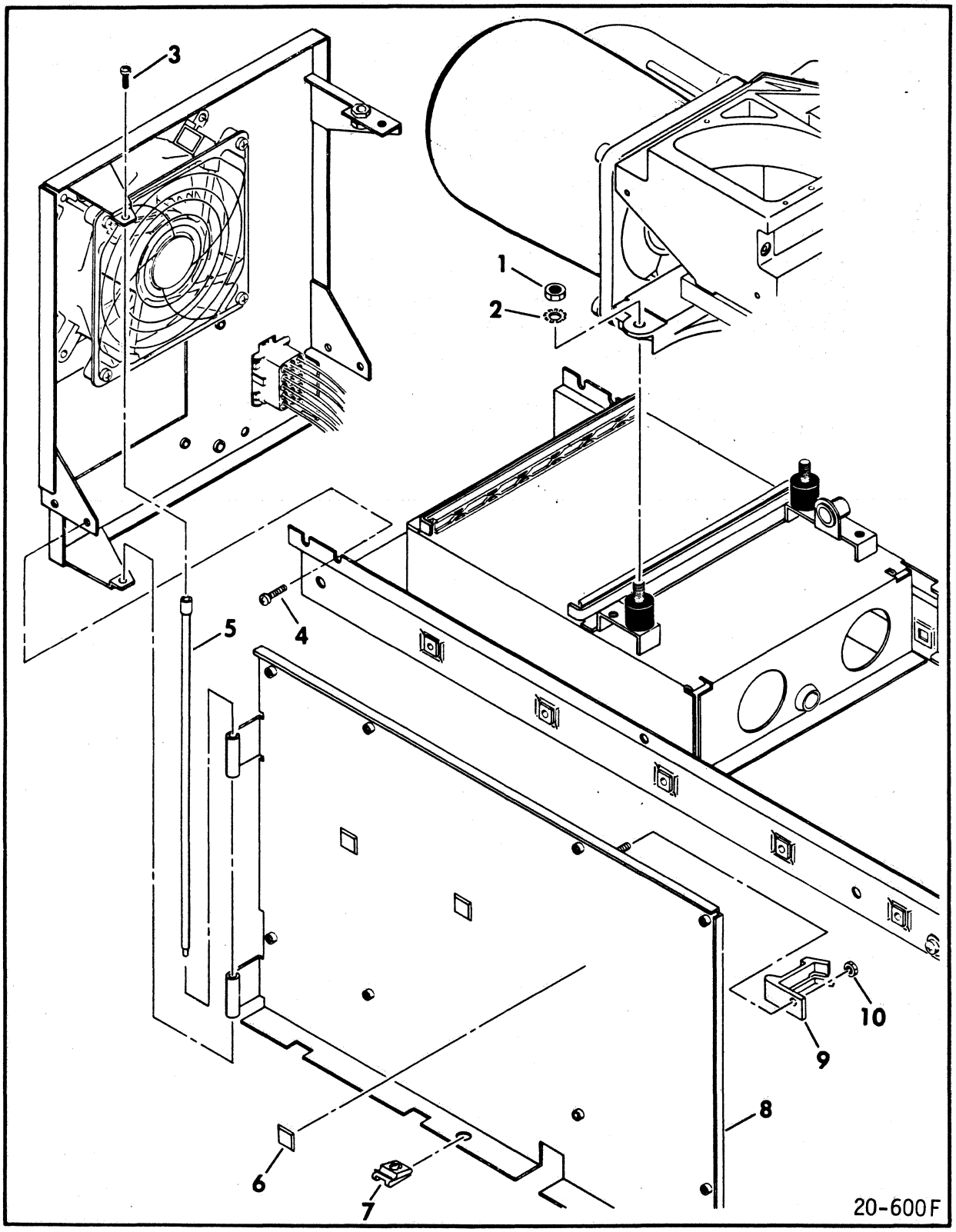


Figure 4-6

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	10125301	NUT, Hex, 1/4-20	
2	10126404	LOCKWASHER, 1/4	
3	70514276	SCREW, PHH, 6-32 x 3/8	S/C 09 & Abv
4	92743158	SCREW, PHH, 6-32 x 1/4	
5	93913858	HINGE, Pin	S/C 08 & Blw
5	92444804	HINGE, Pin	S/C 09 & Abv
	92491800	LOGIC SUPPORT ASSEMBLY	
6	51805802	BUMPER	
7	94317800	RETAINER	
8	92444813	PANEL, Support	
9	93148610	LATCH, Card	See Note 1
10	92071008	NUT, Hex, 6-32	See Note 1

Note 1: Used on drives with 2-board read/write.

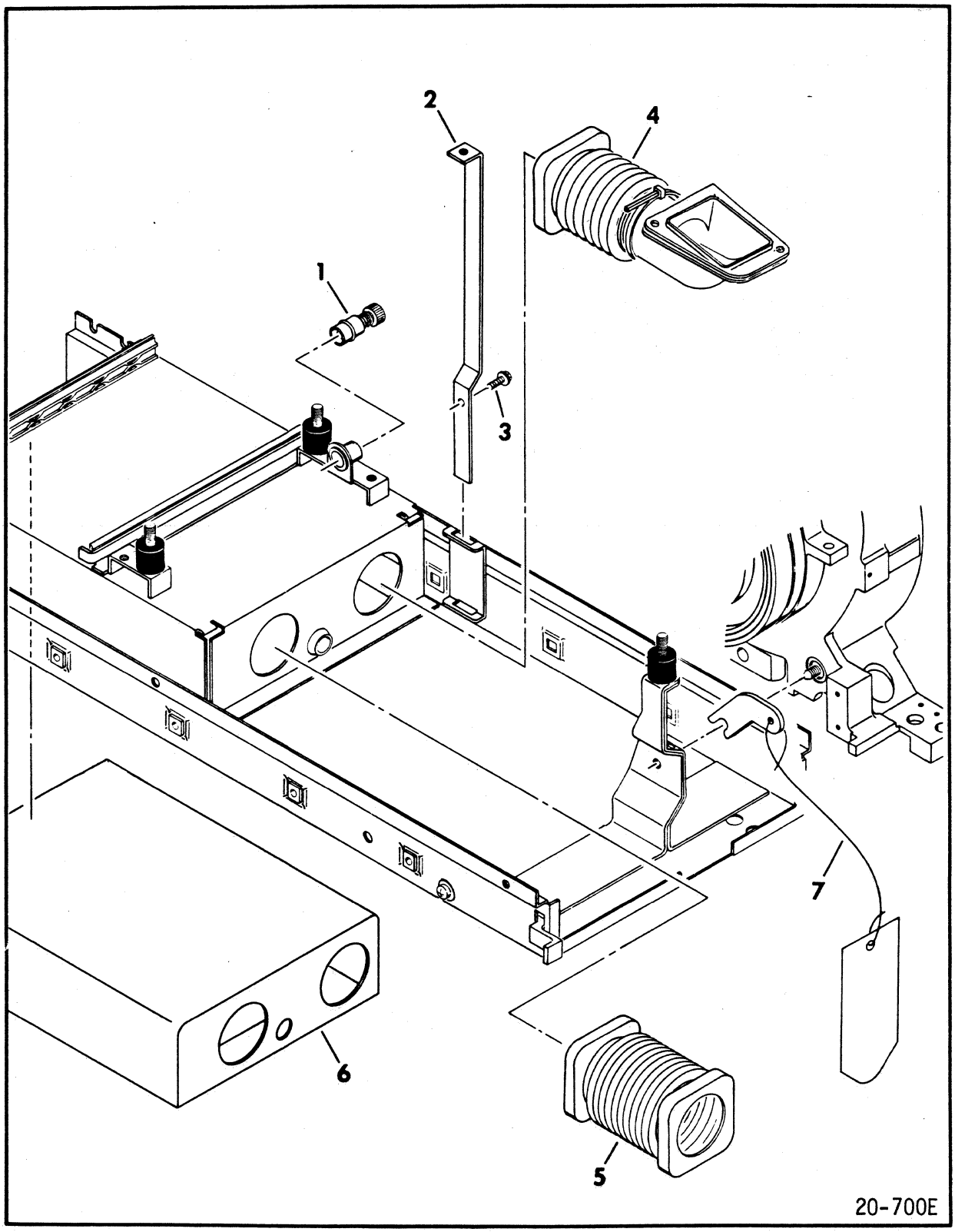


Figure 4-7

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	81400910	SCREW, Retractable	
2	93263408	SUPPORT, Logic Board	
3	93592158	SCREW, Washer Hd, 6-32 x 1/4	
4	93496000	AIR DUCT ASSEMBLY	See Note 1
4	93496001	AIR DUCT ASSEMBLY	See Note 2
5	72869100	DUCT, Air	
6	Spare	FILTER, Absolute	
7	46362400	SHIPPING CLIP ASSEMBLY	

Note 1: Used on drives S/C 20 and blw.

Note 2: Used on drives S/C 21 and abv, and drives with ECO 03964 installed.

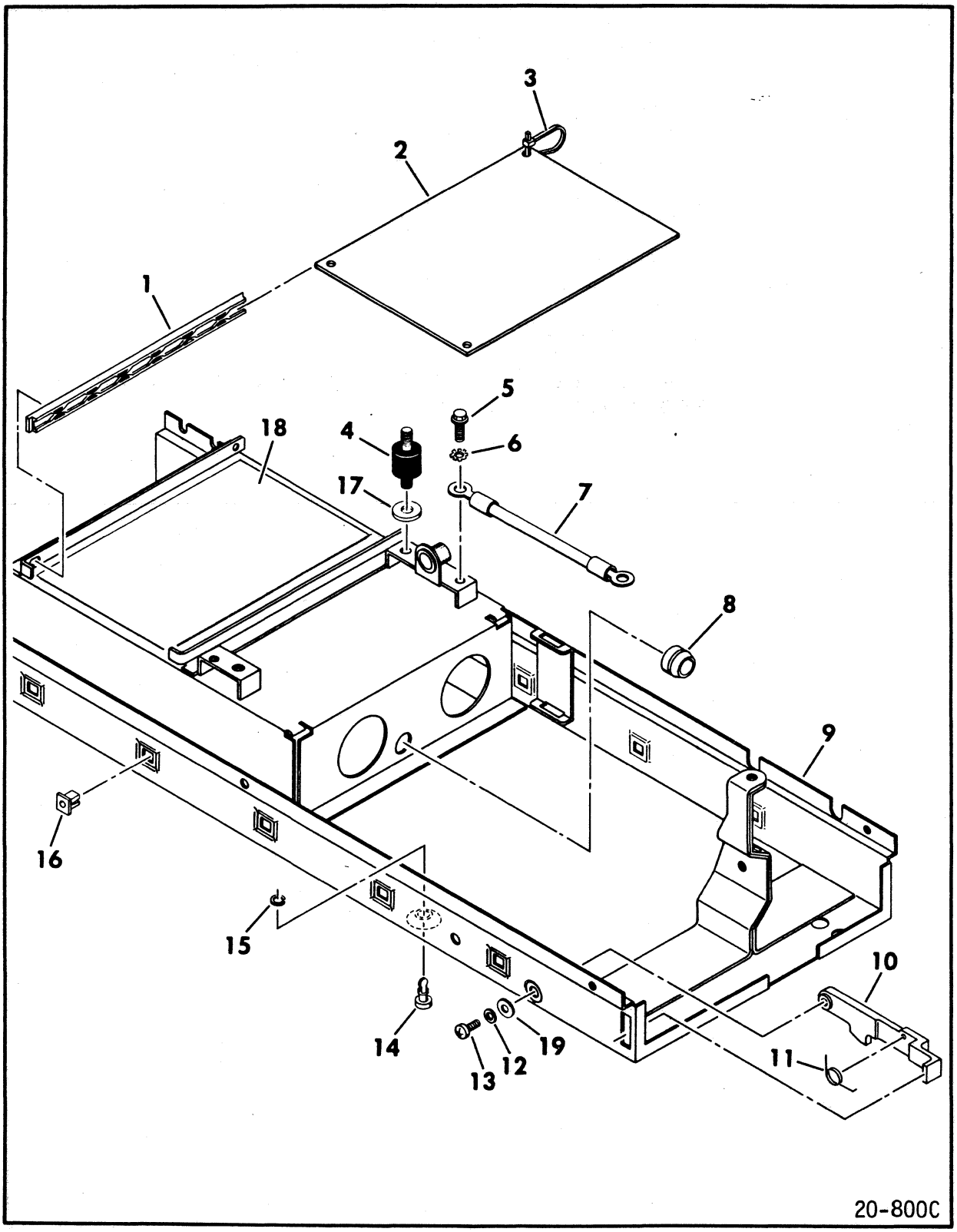


Figure 4-8

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	72856240	SLIDE	
2	Spare	MOTOR SPEED CONTROL BOARD	
3	94277422	TIEWRAP	
4	93568013	MOUNT, Vibration	
5	93592238	SCREW, Washer Hd, 10-24 x 3/8	
6	10126403	LOCKWASHER, #10	
7	94281427	GROUND CABLE	
8	93913860	GROMMET	
9	47127428	BASE	
10	92444803	LATCH	See Note 1 below
11	93263415	SPRING	See Note 1 below
12	10125606	WASHER, #8	See Note 1 below
13	93749200	SCREW, PHH, 8-32 x 3/8	See Note 1 below
14	94317720	FASTENER	
15	94317900	RETAINER	
16	72854290	NUT, Square	
17	92777150	WASHER, Special, 1/4	Used on older units only
18	47010560	TAPE, Polyvinyl	
19	93564019	WASHER, Nylon	

Note 1: Not used on PA3A1B/D/E/N, PA3A2D/E/G

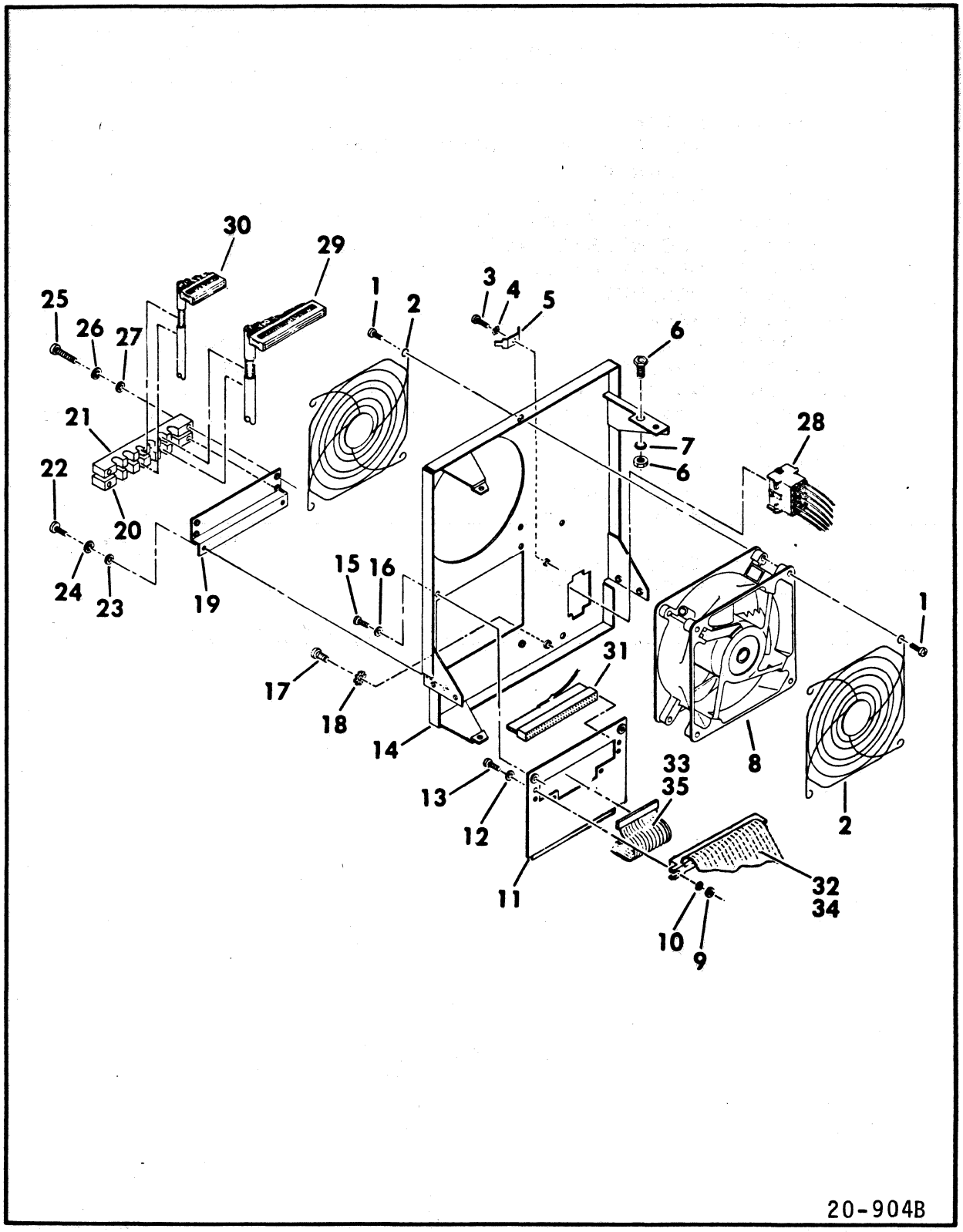


Figure 4-9 (Units With Remote Power Supply)

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	10127124	SCREW, PHH, 8-32 x 5/8	See Note 1
2	94375408	FINGER GUARD, Fan	
3	10127111	SCREW, PHH, 6-32 x 1/4	
4	10126401	LOCKWASHER, #6	
5	94274113	TERMINAL	
6	93879001	JACK, Banana	
7	10126106	LOCKWASHER, 1/4	
8	Spare	FAN ASSEMBLY	
9	10125103	NUT, Hex, 4-40	
10	10125801	LOCKWASHER, #4	
11	72856525	PLATE, I/O	Single Ch Units
11	72856521	PLATE, I/O	Dual Ch Units
12	10125603	WASHER, #4	
13	92743088	SCREW, PHH, 4-40 x 1/2	
14	75038391	PANEL, Rear	S/C 08 & Blw
14	92444827	PANEL, Rear	S/C 09 & Abv
15	10127111	SCREW, PHH, 6-32 x 1/4	
16	10125803	LOCKWASHER, #6	
17	10127132	SCREW (GND), PHH, 10-24 x 1/2	
18	10126403	LOCKWASHER, #10	
19	72851240	BRACKET, Cable	
20	72851231	CLAMP, Strain Relief	
21	72851230	CLAMP, Grounding	
22	17901510	SCREW, PHH, 6-32 x 1/2	
23	10125605	WASHER, #6	
24	10126401	LOCKWASHER, #6	
25	10127146	SCREW, PHH, 10-32 x 7/8	
26	10126403	LOCKWASHER, #10	
27	10125607	WASHER, #10	
	93920481	CLAMP (for flat cables)	
28	Spare	DC HARNESS (P19/P21/P22/ P36/P37/J40)	
29	Optional	"A" CABLE, External	
30	Optional	"B" CABLE, External	
31	Optional	TERMINATOR	
32	77431010	STRAIN RELIEF, A Cable	
33	77431008	STRAIN RELIEF, B Cable	
34	92439610	A CABLE, Int (Single Ch)	
34	92439615	A CABLE, Int (Dual Ch, Ch 1)	See Note 2
34	92439614	A CABLE, Int (Dual Ch, Ch 2)	See Note 2
35	92246311	B CABLE, Int (Single Ch)	
35	92246315	B CABLE, Int (Dual Ch, Ch 1)	See Note 2
35	92246314	B CABLE, Int (Dual Ch, Ch 2)	See Note 2

Note 1: Older fans with untapped holes use self-tapping screws, P/N 17901518.

Note 2: Not used on AEDN boards.

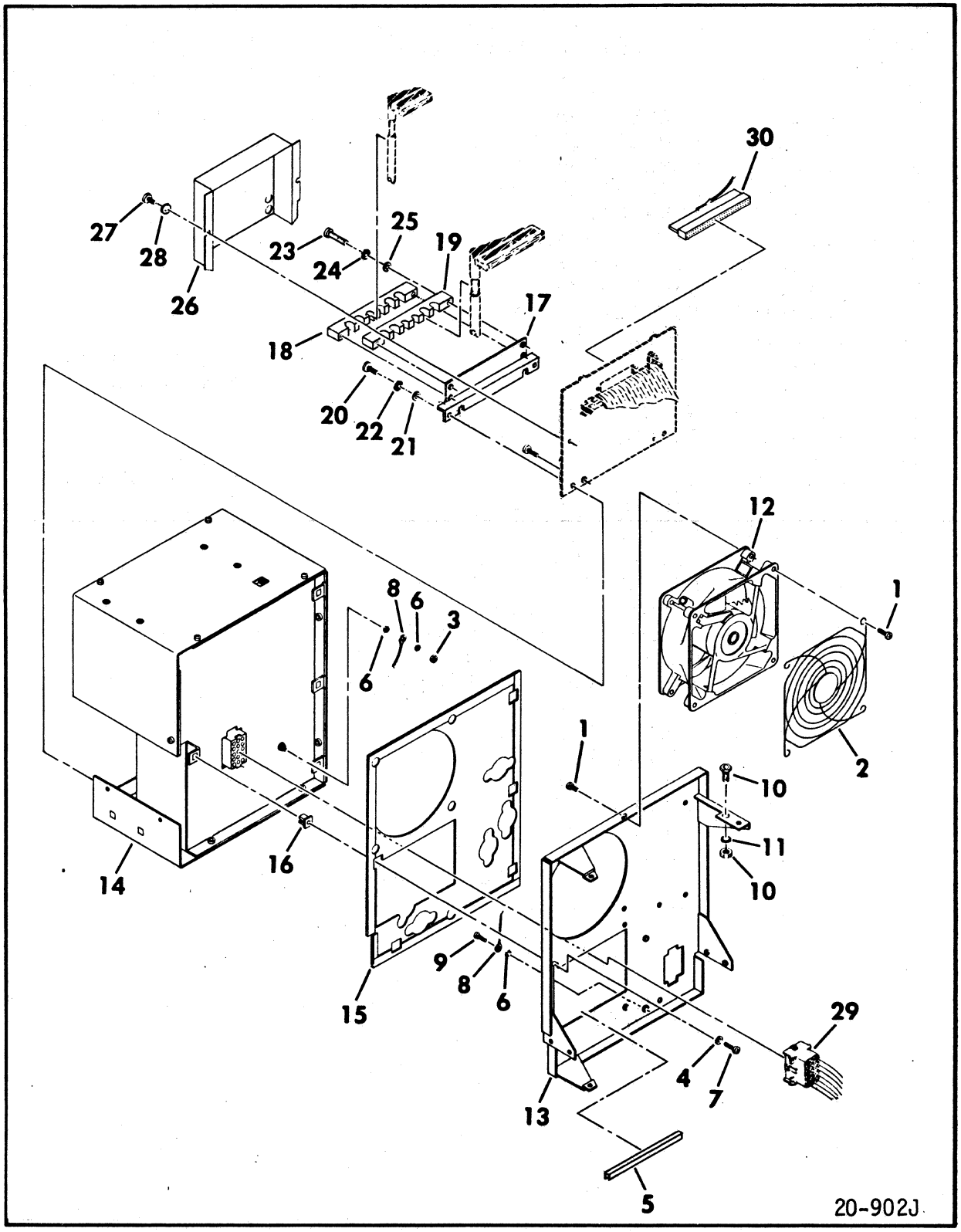


Figure 4-9 (Units With Integral Power Supply)

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	10127124	SCREW, PHH, 8-32 x 5/8	See Note 1
2	94375408	FINGER GUARD, Fan	
3	10125108	NUT, Hex, 10-32	
4	10125607	WASHER, #10	
5	94060003	CHANNEL, Rubber	
6	10126403	LOCKWASHER, #10	
7	94375825	SCREW, PHH, 8-16 x 1/2	
8	94281437	GROUND CABLE	
9	10127131	SCREW, PHH, 10-24 x 3/8	
10	93879001	JACK, Banana	
11	10126106	LOCKWASHER, 1/4	
12	Spare	FAN ASSEMBLY	
13	92444827	PANEL, Rear	
14	Spare	POWER SUPPLY ASSEMBLY, Integral	
15	76376352	GASKET, RF	
16	72854290	NUT, Square	
17	72851240	BRACKET, Cable	See Note 2
17	72851241	BRACKET, Cable	See Note 3
18	72851231	CLAMP, Strain Relief	See Note 2
18	72851232	CLAMP, Strain Relief	See Note 3
19	72851230	CLAMP, Grounding	See Note 2
19	72851233	CLAMP, Grounding	See Note 3
	93920481	CLAMP (for flat cables)	See Note 2
	93920483	CLAMP (for flat cables)	See Note 3
20	17901510	SCREW, PHH, 6-32 x 1/2	See Note 2
20	10127122	SCREW, PHH, 8-32 x 3/8	See Note 3
21	10125605	WASHER, #6	See Note 2
21	10125606	WASHER, #8	See Note 3
22	10126401	LOCKWASHER, #6	See Note 2
22	10126402	LOCKWASHER, #8	See Note 3
23	10127146	SCREW, PHH, 10-32 x 7/8	
24	10126403	LOCKWASHER, #10	
25	10125607	WASHER, #10	
26	92070380	SHIELD, I/O	See Note 2
26	92070381	SHIELD, I/O	See Note 3
27	93660041	SCREW, PHH, 6-32 x 5/16	
28	10125605	WASHER, #6	
29	Spare	DC HARNESS (P15/P19/P21/P22/ P36/P37)	
30	Optional	TERMINATOR	

Note 1: Older fans with untapped holes use self-tapping screws, p/n 17901518.

Note 2: Used on longer type (p/n 81542300) power supply.

Note 3: Used on shorter type power supplies.

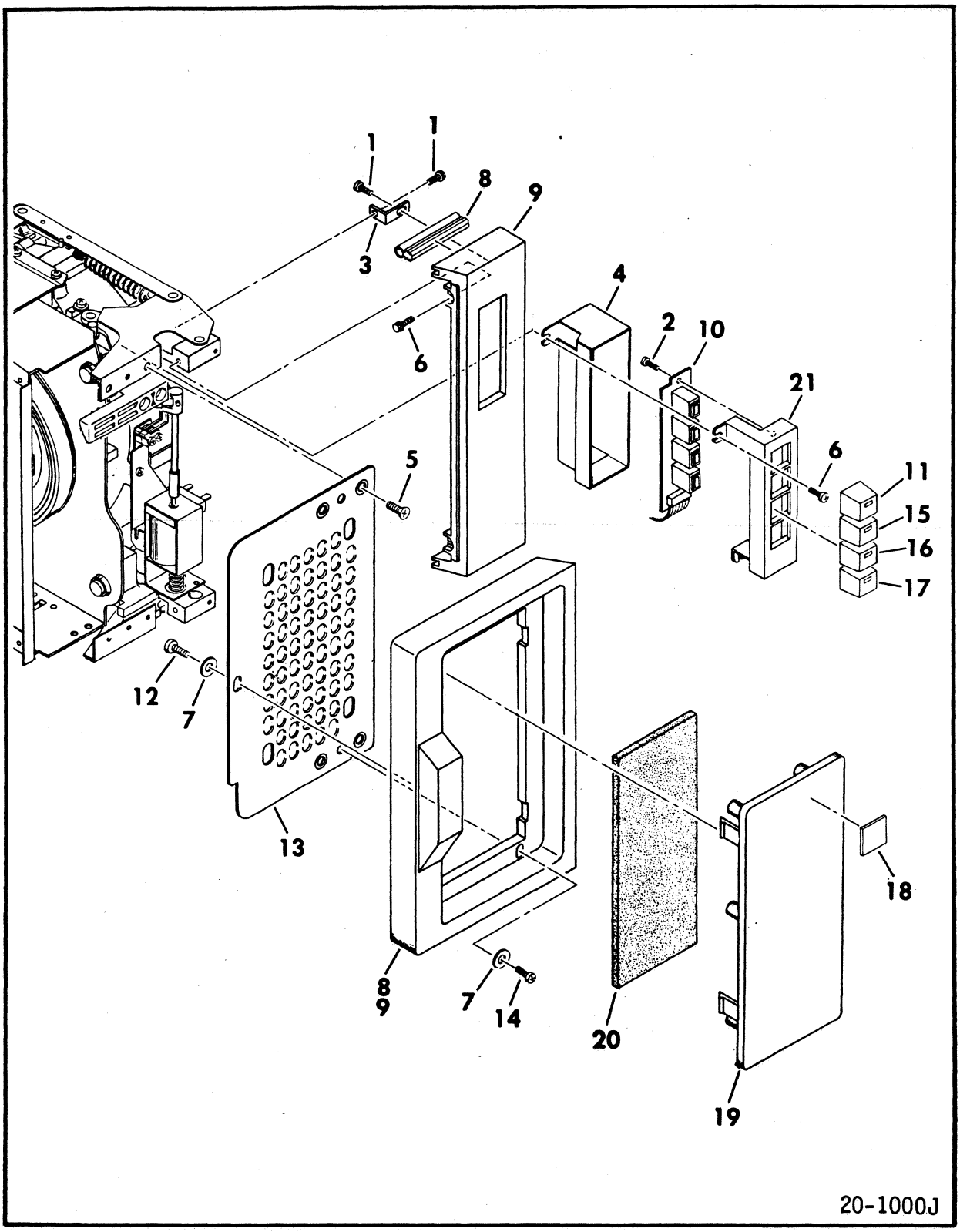


Figure 4-10

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	93660041	SCREW, PHH, 6-32 x 5/16	
2	10127102	SCREW, PHH, 4-40 x 1/4	See Note 2
3	93263447	BRACKET, Upper, Control Panel	
4	75038393	SHIELD	See Note 2
5	10125734	SCREW, PHH, 10-24 x 5/16	
6	93592162	SCREW, Washer Hd, 6-32 x 3/8	
7	10125607	WASHER, #10	
8	94377003	SEAL (3 ft required)	S/C 02 & Abv
9	72860500	FRONT DOOR ASSEMBLY	S/C 01
9	Optional	FRONT DOOR ASSEMBLY	S/C 02 & Abv
10	Spare	OPERATOR PANEL	
11		LOGIC PLUG	See Note 3
12	93660111	SCREW, PHH, 10-32 x 3/8	
13	47060770	PLATE, Support	
14	93660126	SCREW, PHH, 10-24 x 5/8	
15	94394255	LENS, "START"	See Note 1
15	15181644	LENS, "START"	See Note 2
16	94394256	LENS, "FAULT"	See Note 1
16	15181643	LENS, "FAULT"	See Note 2
17	94394257	LENS, "WRITE PROTECT"	See Note 1
17	15181645	LENS, "WRT PRT"	See Note 2
18	Optional	PRODUCT EMBLEM	
19	Optional	PANEL, Insert	
20	Spare	FILTER, Primary	
21	75038351	BRACKET, Switch	See Note 2

Note 1: Used on older operator panels, which have logic plugs without indicator lights.

Note 2: Used on newer operator panels, which have logic plugs with indicator lights.

Note 3: Refer to table 4-3 (Accessories) for listing of available logic plugs.

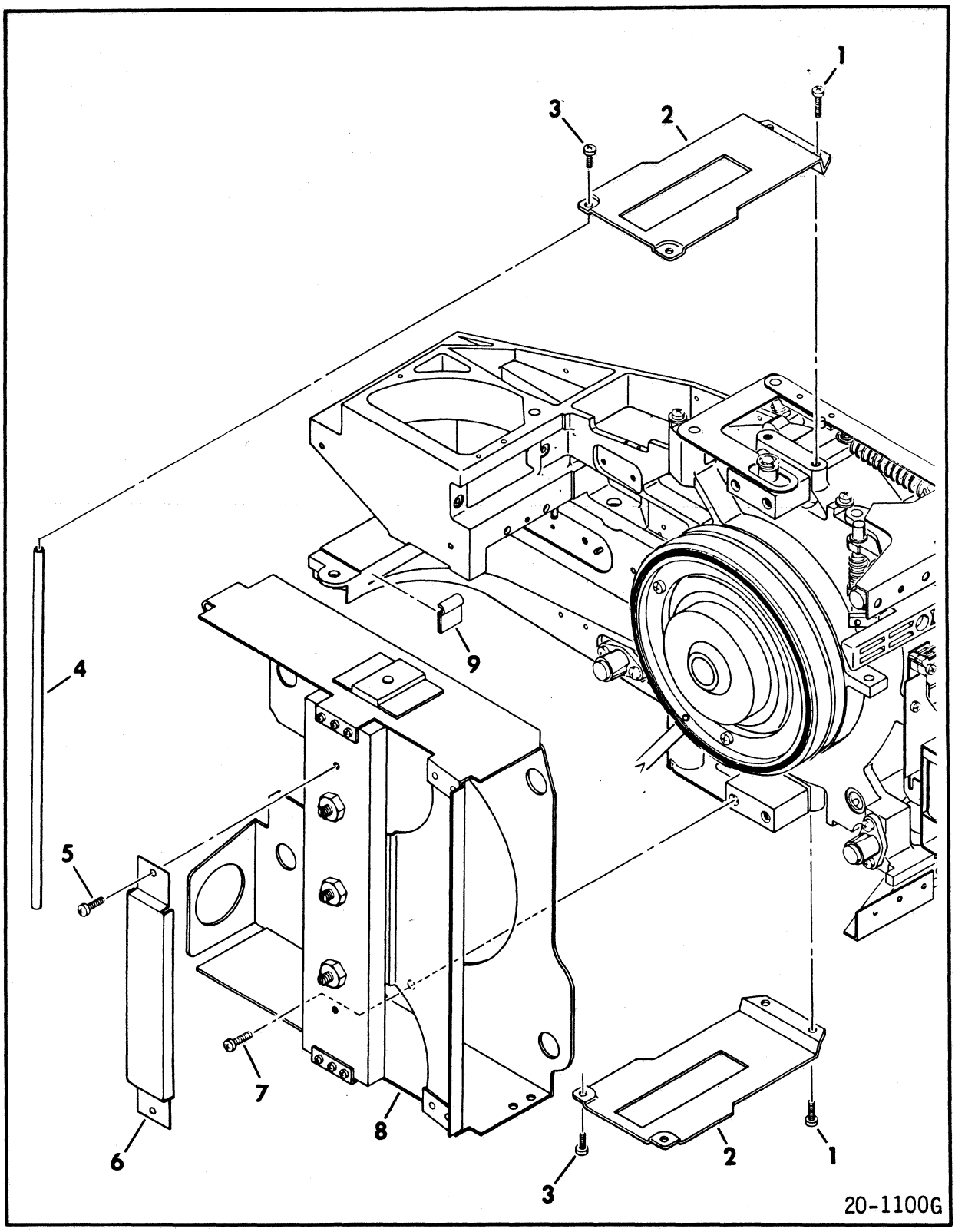


Figure 4-11

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	93749240	SCREW, PHH, 10-24 x 1/2	
	81305102	SUPPORT BRACKET ASSEMBLY	See Note 3
	81305103	SUPPORT BRACKET ASSEMBLY	See Note 4
2	75038376	SUPPORT, Slide	See Note 3
2	46455400	SUPPORT, Slide	See Note 4
3	10125702	SCREW, PHH, 4-40 x 1/4	See Note 3
3	10127102	SCREW, PHH, 4-40 x 1/4	See Note 4
4	72864300	ROD, Support, Slide	See Note 3
4	46455390	ROD, Support, Slide	See Note 4
5	92820095	SCREW, Socket Hd, 4-40 x 3/16	See Note 1
5	92820158	SCREW, Socket Hd, 6-32 x 1/2	See Note 2
6	75038382	BRACKET, Pack Receiver	See Note 1
6	93148614	BRACKET, Pack Receiver	See Note 2
7	10125724	SCREW, PHH, 8-32 x 3/8	See Note 3
7	10127120	SCREW, PHH, 8-32 x 1/4	See Note 4
8	72860305	PACK RECEIVER	See Note 3
8	72860306	PACK RECEIVER	See Note 4
9	80455500	CLIP	

Note 1: Used on drives S/C 09 & blw.
Note 2: Used on drives S/C 10 & abv, and drives with ECO 03478 installed.
Note 3: Used on drives S/C 16 & blw.
Note 4: Used on drives S/C 17 & abv, and drives with ECO 03797 installed.

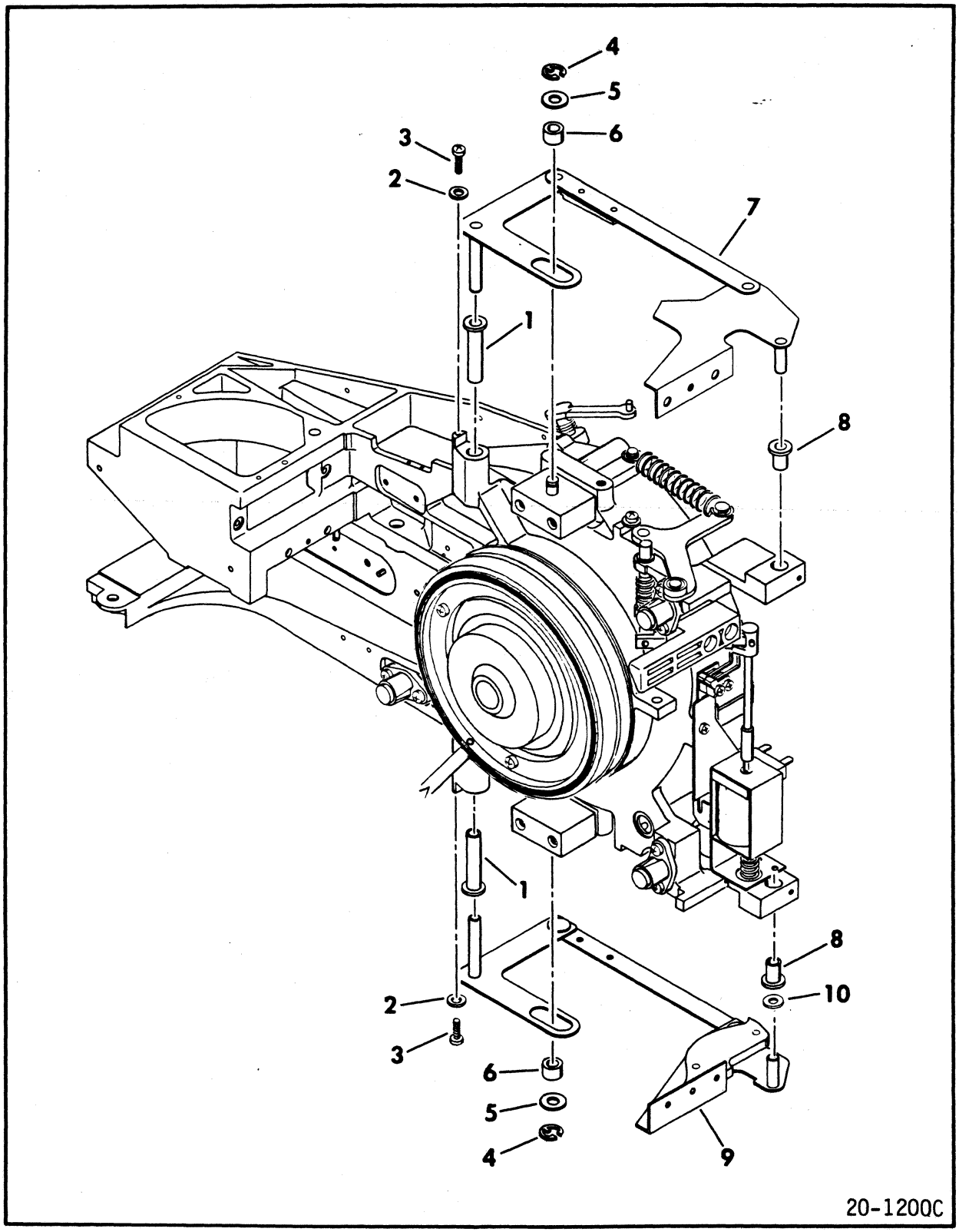


Figure 4-12

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	41274010	BEARING, Flanged	
2	93564055	WASHER, Nylon	
3	10127111	SCREW, PHH, 6-32 x 1/4	
4	92033038	RETAINER, Ring	
5	93564054	WASHER, Nylon	
6	93715006	BEARING, Needle	
7	81763702	UPPER LINKAGE ASSEMBLY	
8	41274009	BEARING, Flanged	
9	70919802	LOWER LINKAGE ASSEMBLY	
10	93564019	WASHER, Nylon	

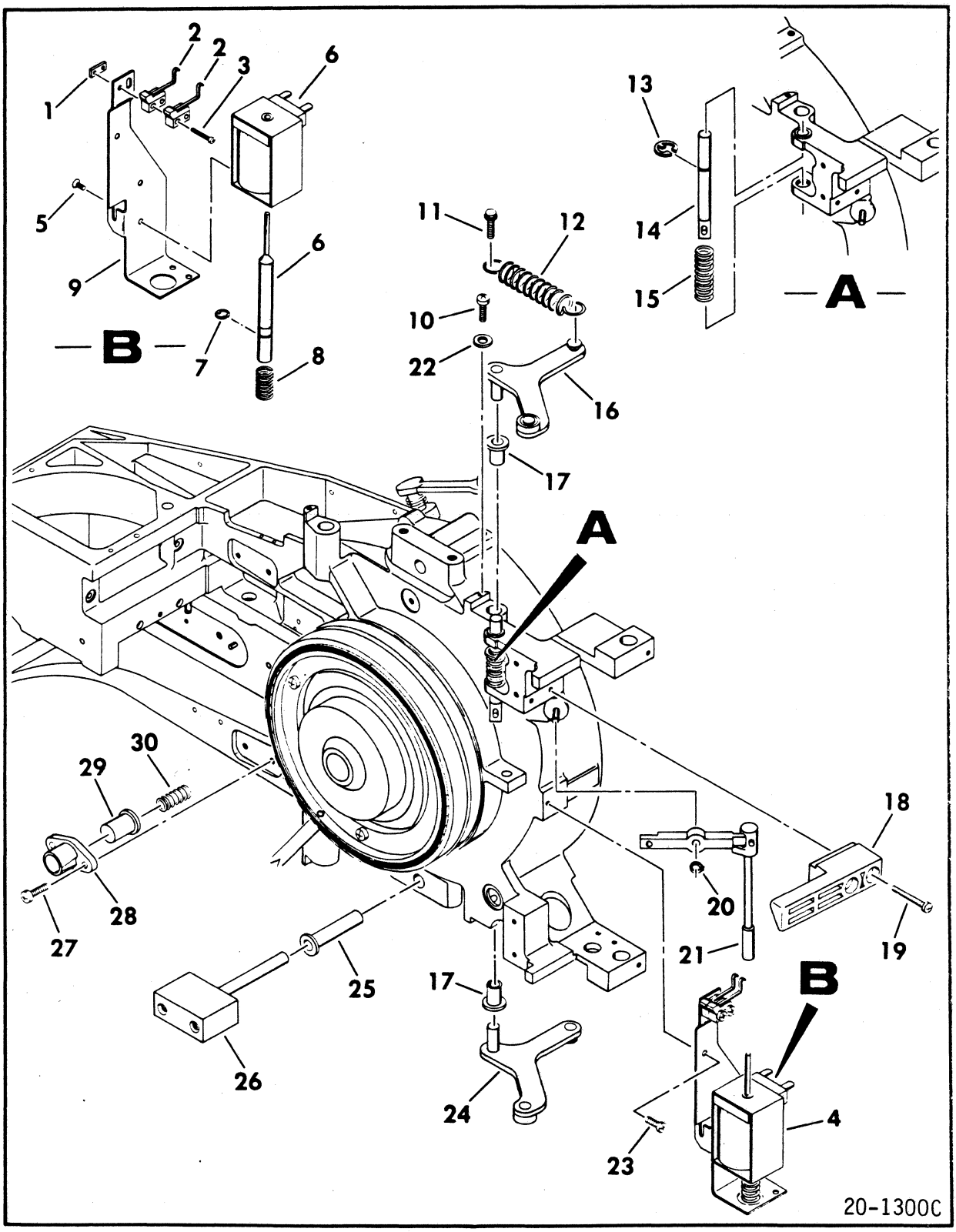

1
2
2
3
6
5
9
6
7
8
B
11
12
10
22
16
17
A
13
14
15
A
30
29
28
27
25
26
17
24
20
21
18
19
B
4
23
20-1300C

Figure 4-13

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	83292404	PLATE, Nut	
2	Spare	SWITCH	
3	10127315	SCREW, PHH, 2-56 x 5/8	
4	72860405	SOLENOID ASSEMBLY	
5	93749156	SCREW, PHH, 6-32 x 3/16	
6	Spare	SOLENOID, DC	
7	92033038	RETAINER, Ring	
8	93148690	SPRING, Compression	
9	93913889	BRACKET, Solenoid	
10	10127111	SCREW, PHH, 6-32 x 1/4	
11	93592160	SCREW, Washer Hd, 6-32 x 5/16	
12	94203786	SPRING, Extension	
13	92033038	RETAINER, Ring	
14	93263417	ROD, Lock, Door	
15	93148690	SPRING, Compression	
16	81417081	CAM, Upper, Door	
17	41274009	BEARING, Flanged	
18	75038300	LOCATOR, Pack	
19	93749172	SCREW, PHH, 6-32 x 1	
20	92033104	RETAINER, Ring	
21	80496501	PIVOT ARM ASSEMBLY	
22	93564055	WASHER, Nylon	
23	93749162	SCREW, PHH, 6-32 x 3/8	
24	81417080	CAM, Lower, Door	
25	41274010	BEARING, Flanged	
26	72867900	BLOCK, Guide	
27	10127114	SCREW, PHH, 6-32 x 1/2	
28	93263423	HOUSING, Pin	
29	93263422	PIN	
30	94205741	SPRING, Compression	

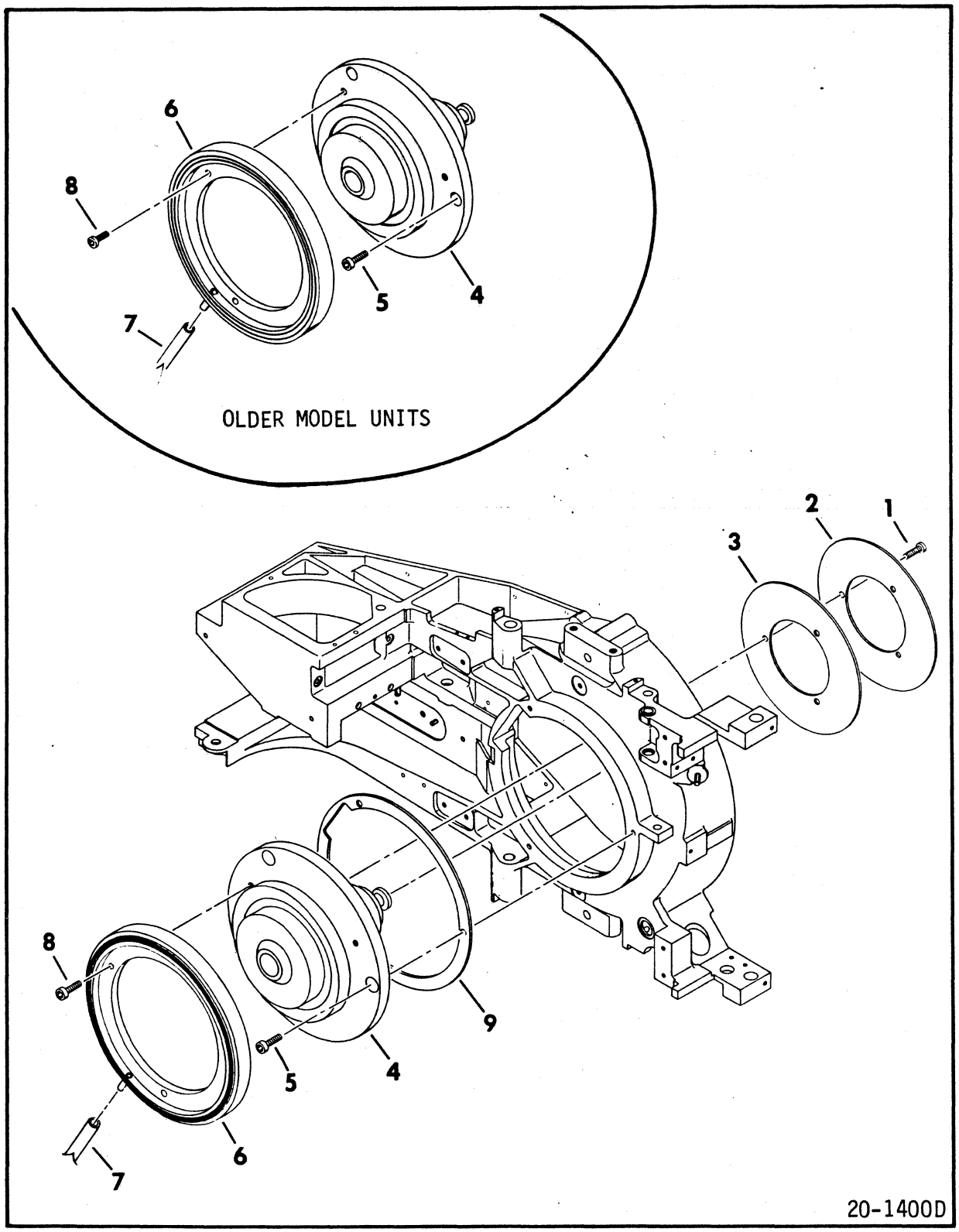


Figure 4-14

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	70526916	SCREW, Socket Hd, 6-32 x 3/8	
2	72868001	SHIELD, Shiny	See Notes 1,3
2	72868003	SHIELD, Shiny	See Note 2
3	72868000	SHIELD, Dull	See Notes 1,3
3	72868002	SHIELD, Dull	See Note 2
4	Spare	SPINDLE ASSEMBLY	
5	10126234	SCREW, Socket Hd, 10-24 x 1/2	
6	93417400	PACK RECEIVER SUPPORT RING	See Notes 1,3
6	47060782	PACK RECEIVER SUPPORT RING	See Note 2
7	94165002	TUBING, Air	
8	10126226	SCREW, Socket Hd, 8-32 x 1/2	
9	72855622	GASKET	S/C 07 & Abv

Note 1: Used on S/C 08 & blw.
Note 2: Used on S/C 09 & abv, and units with ECO 03465 installed.
Note 3: Replace with Spindle Assembly Replacement Kit, p/n 41540900, which includes newer shields, spindle assembly, and pack receiver support ring.

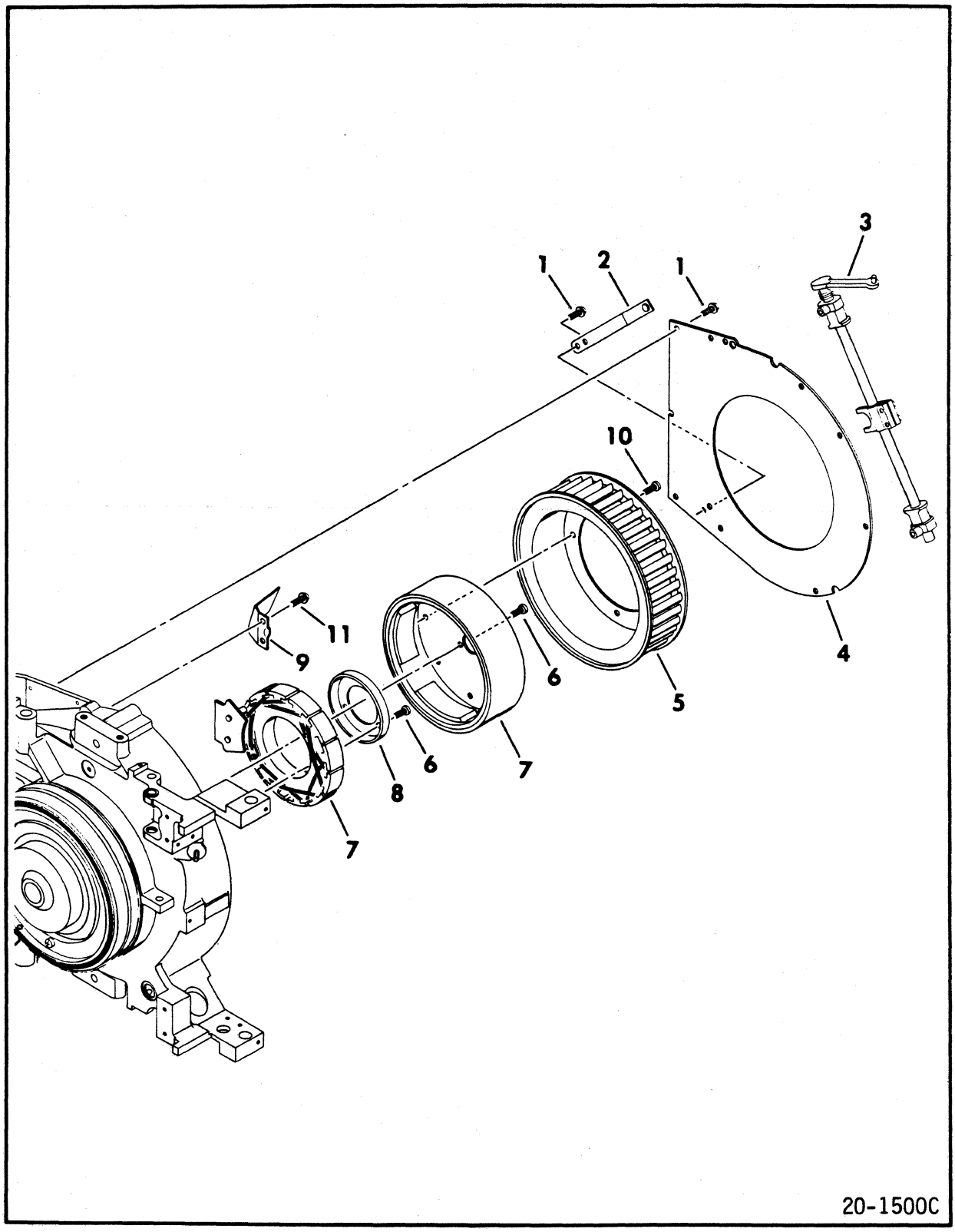


Figure 4-15

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	92001702	SCREW W/WASHER, 6-32 x 5/16	
2	Spare	GROUND SPRING, Spindle	
3	76434101	TRIP ROD ASSEMBLY	
4	75038308	COVER, Volute	
5	81860730	IMPELLER	
6	92743162	SCREW, PHH, 6-32 x 3/8	
7	Spare	MOTOR AND CABLE ASSEMBLY	
8	72850900	CLAMP, Motor	
9	93913871	CLAMP, Cable	
10	93660039	SCREW, PHH, 6-32 x 1/4	
11	93749162	SCREW, PHH, 6-32 x 3/8	

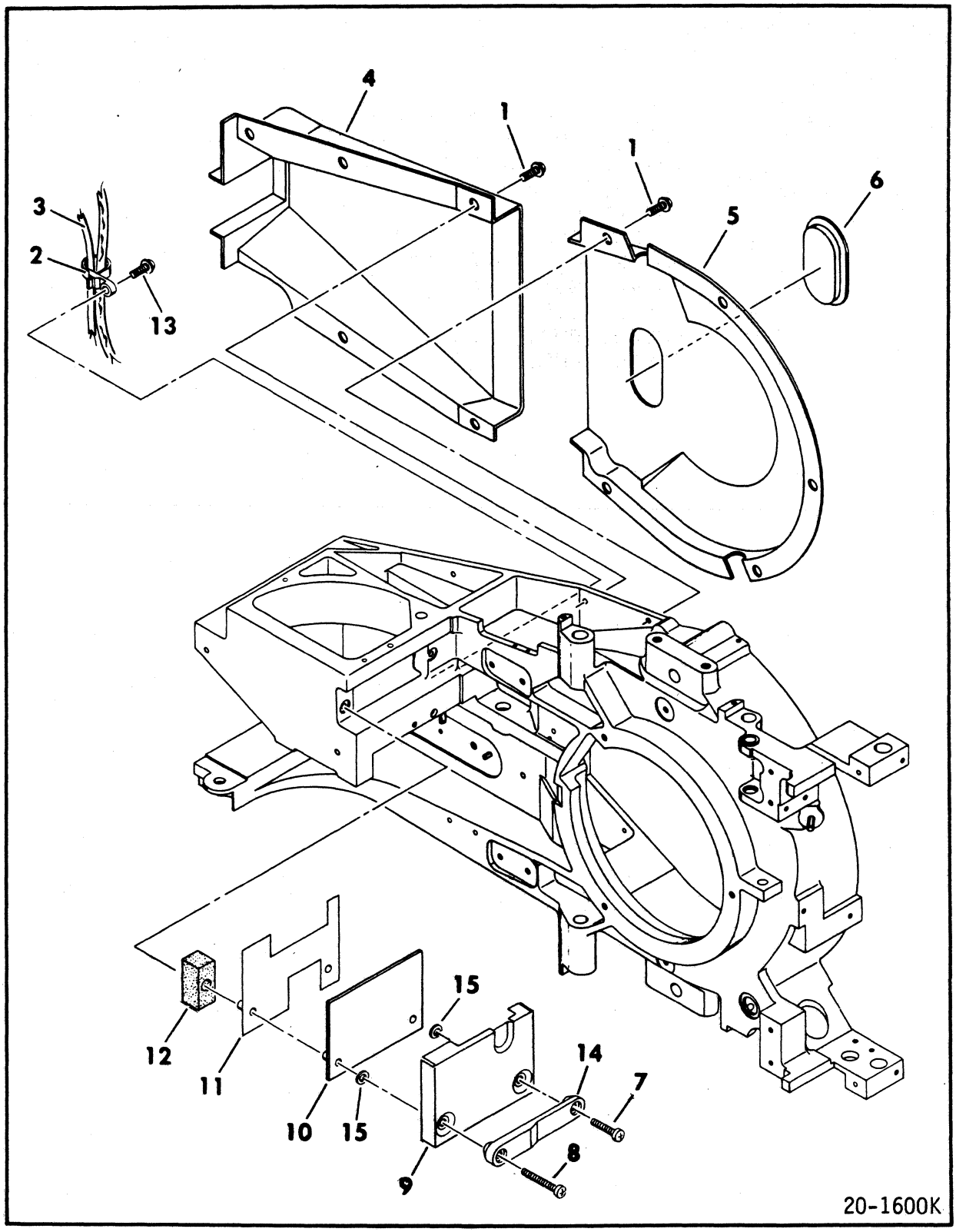


Figure 4-16

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	92001702	SCREW W/WASHER, 6-32 x 5/16	
2	94277421	TIEWRAP	
3	94497000	VOICE COIL CABLE ASSEMBLY	
4	93148603	AIR COVER, Center	
5	93243425	AIR COVER, End	
6	92238700	PLUG, Button	
7	10127116	SCREW, PHH, 6-32 x 3/4	S/C 09 & Blw
7	10127119	SCREW, PHH, 6-32 x 1 1/4	S/C 10 & Abv
8	10127118	SCREW, PHH, 6-32 x 1	
9	47005590	COVER, R/W Preamp Board	
10	Spare	R/W PREAMP BOARD	
11	92555298	SHIELD, R/W Preamp Board	
12	75151505	SEAL	
13	93749160	SCREW, PHH, 6-32 x 5/16	
14	93265892	STOP, Cartridge	
15	94047001	WASHER, Special	

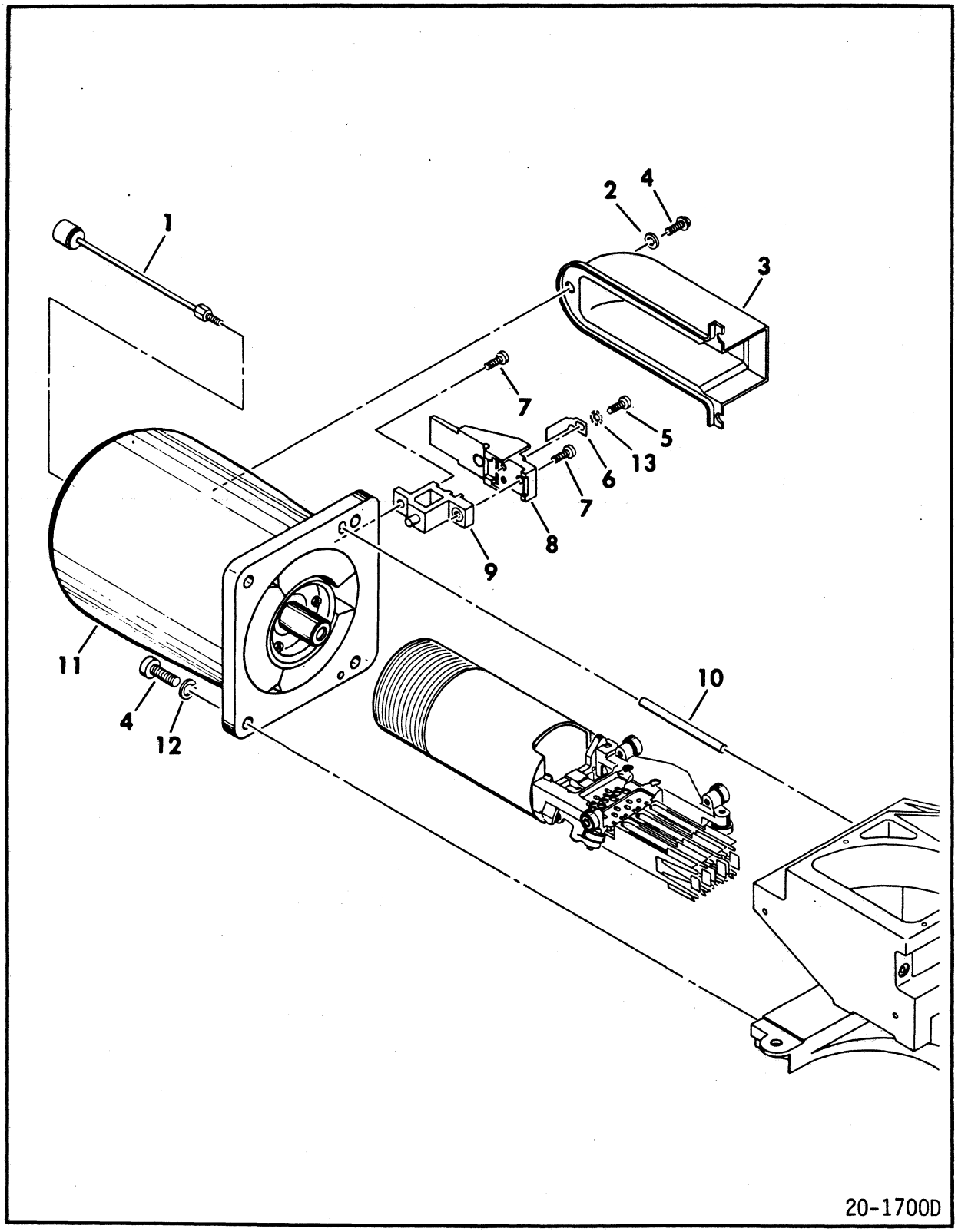


Figure 4-17

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	80559800	ROD ASSEMBLY	
2	10125605	WASHER, #6	
3	75151504	AIR COVER, Magnet	
4	70526946	SCREW, Socket Hd, 1/4-20 x 3/4	
5	10127111	SCREW, PHH, 6-32 x 1/4	
6	75151503	TERMINAL	
7	10127114	SCREW, PHH, 6-32 x 1/2	
8	72865100	CLAMP	
9	72865001	BLOCK, Mounting	
10	92021028	PIN, Dowel	
11	72861000	MAGNET ASSEMBLY	
12	10125806	LOCKWASHER, 1/4	
13	10126401	LOCKWASHER, #6	

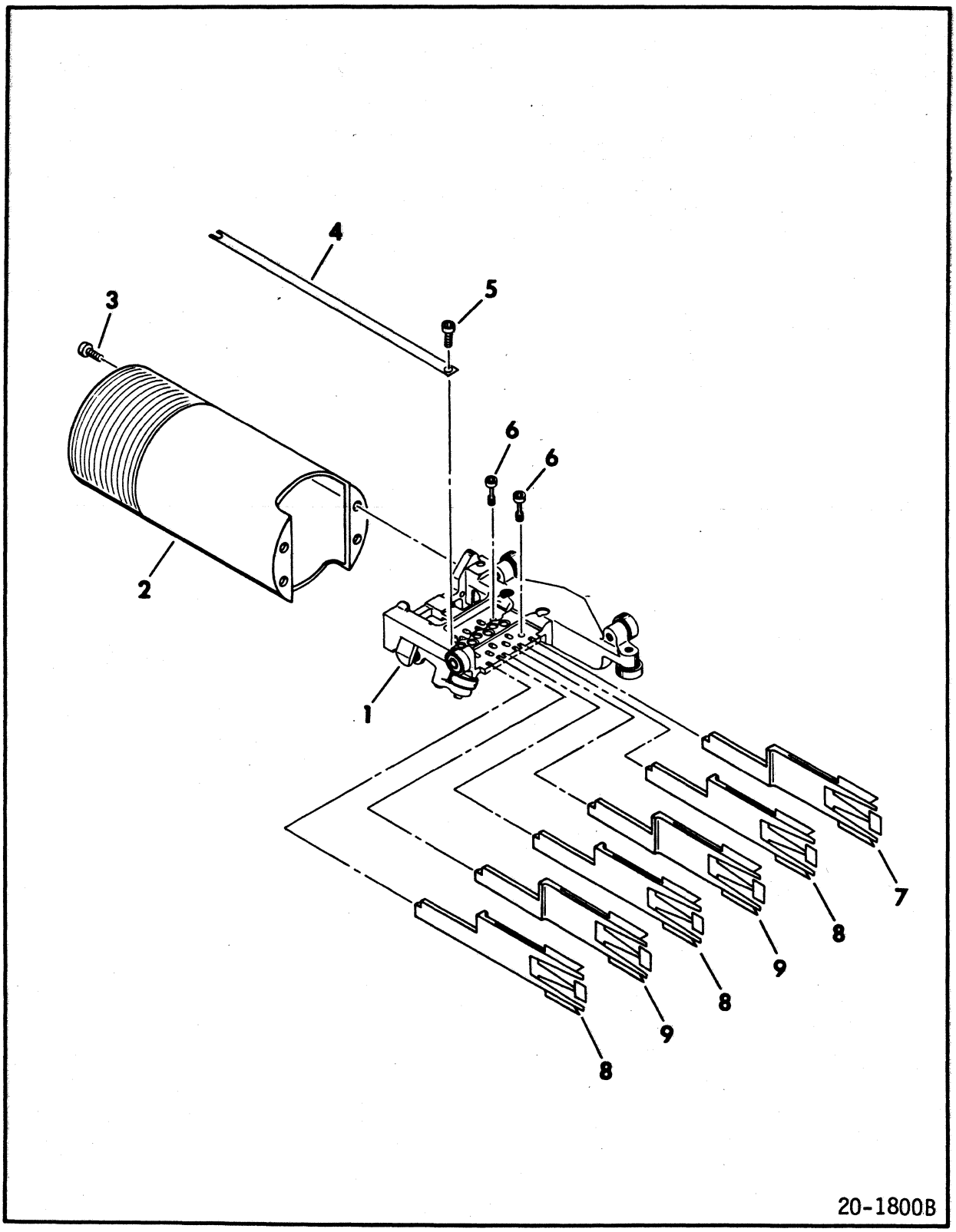


Figure 4-18

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	Spare	CARRIAGE ASSEMBLY	
2	Spare	COIL AND LEAD ASSEMBLY	
3	75017500	SCREW, Special	
4	93263480	GROUND LEAD	
5	92820095	SCREW, Socket Hd, 4-40 x 1/4	
6	Spare	SCREW, Head Arm	
7	Spare	HEAD ARM ASSEMBLY, Servo	
8	Spare	HEAD ARM ASSEMBLY, Data Top	Heads 0,2,4
9	Spare	HEAD ARM ASSEMBLY, Data Bottom	Heads 1,3

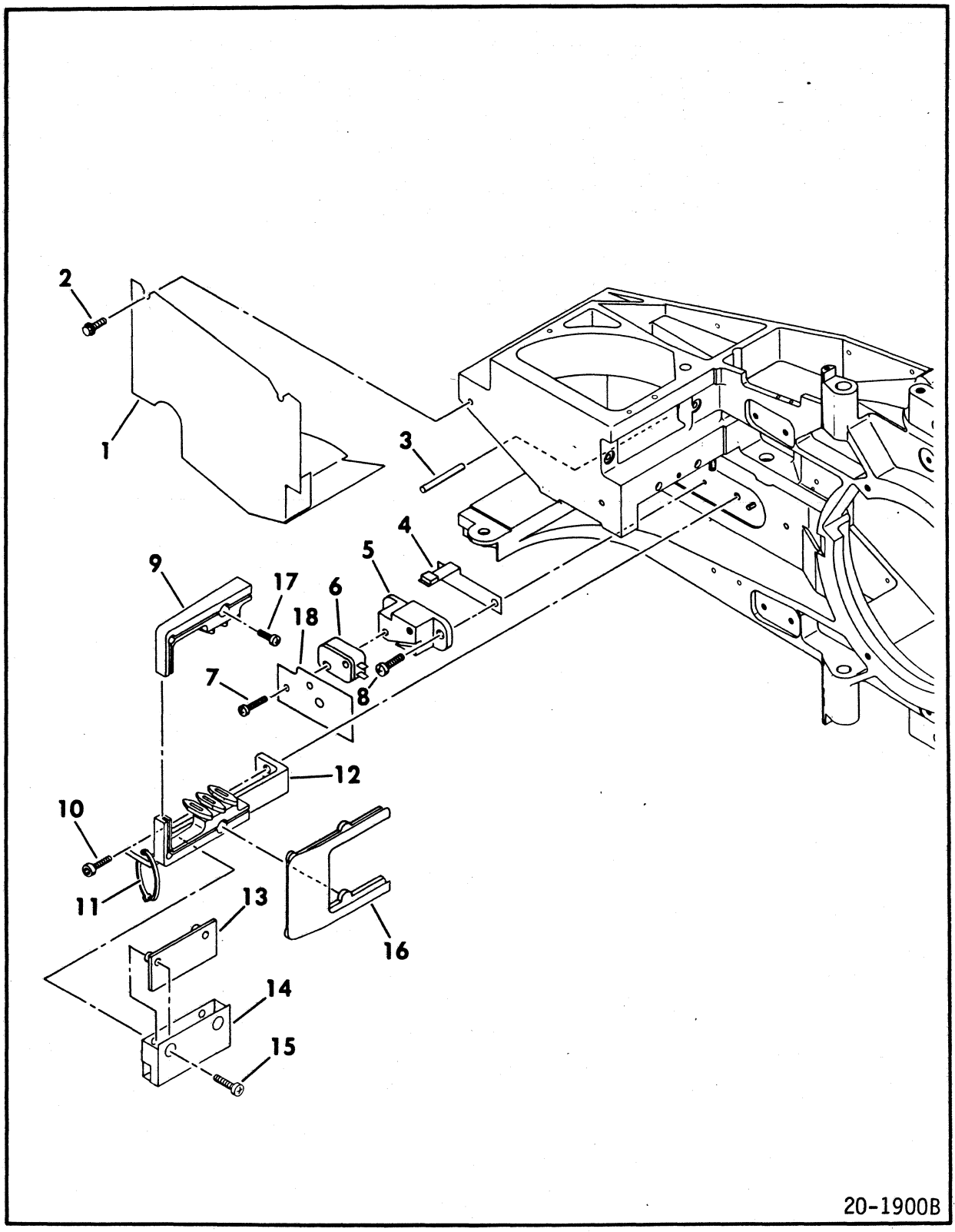


Figure 4-19

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	93263419	AIR COVER, Side	
2	92001710	SCREW W/WASHER, 6-32 x 5/16	
3	93913890	PIN, Carriage Stop	
4	75038379	ARM, Switch	
5	93913864	BLOCK, Switch	
6	93786029	HEADS LOADED SWITCH	
7	10127106	SCREW, PHH, 4-48 x 5/8	
8	10127111	SCREW, PHH, 6-32 x 1/4	
9	83292371	CAM TOWER, Upper	
10	10126234	SCREW, Socket Hd, 10-24 x 1/2	
11	94277400	TIEWRAP	
12	92867400	CAM TOWER, Lower	
13	Spare	SERVO PREAMP BOARD	
14	72868900	COVER, Servo Preamp Board	
15	10127114	SCREW, PHH, 6-32 x 1/2	
16	92555219	GASKET, Rubber	
17	10127113	SCREW, PHH, 6-32 x 3/8	
18	75038345	SHIELD, Switch	

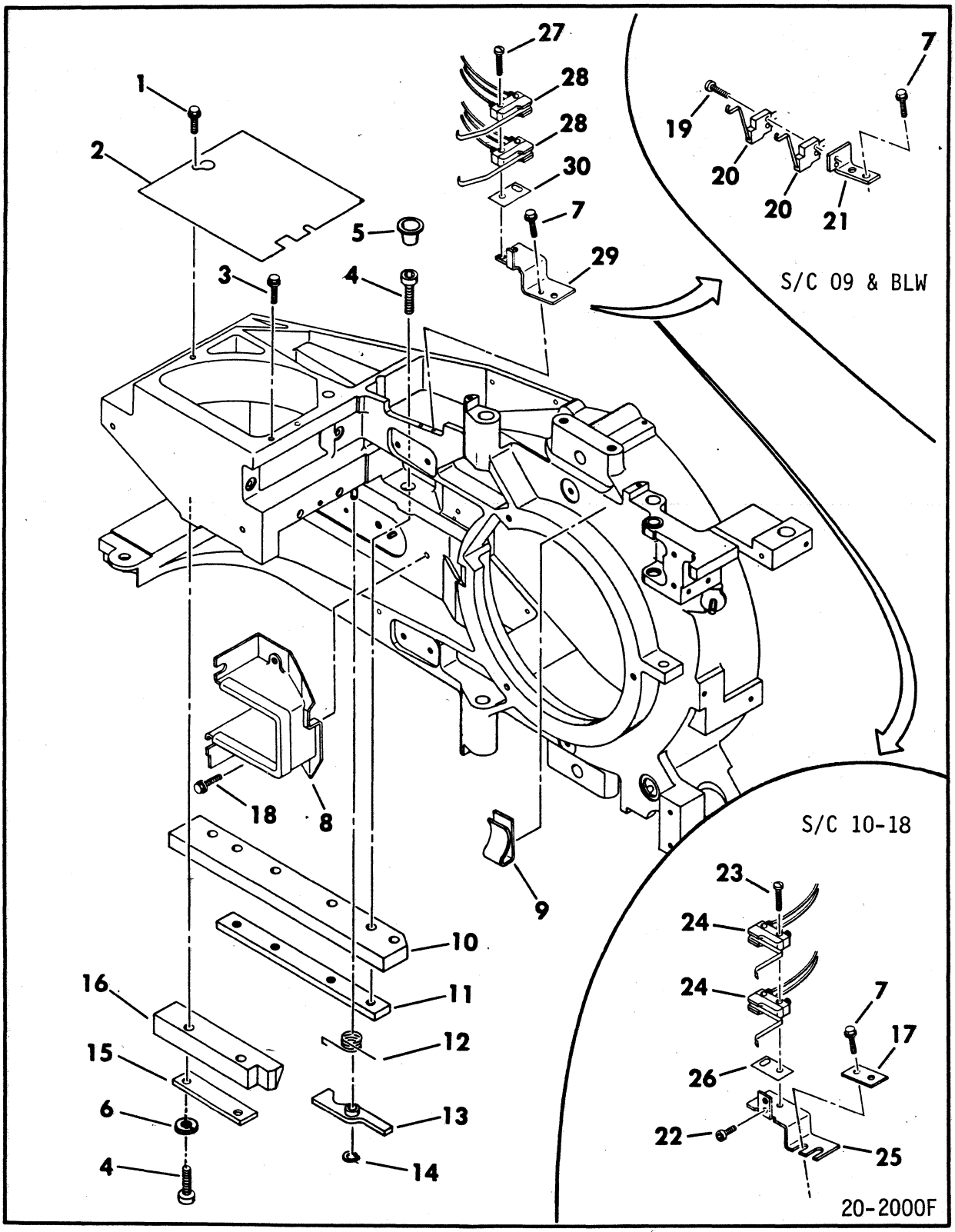

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
20
21
22
23
24
24
25
26
27
28
28
29
30
7
7
S/C 09 & BLW
S/C 10-18
20-2000F

Figure 4-20

INDEX NO	PART NO	PART DESCRIPTION	NOTE
1	92001710	SCREW W/WASHER, 6-32 x 5/16	
2	93263416	AIR COVER, Top	
3	92001709	SCREW W/WASHER, 4-40 x 1/4	
4	10126237	SCREW, Socket Hd, 10-24 x 7/8	
5	94353217	PLUG	
6	10125805	LOCKWASHER, #10	
7	93749162	SCREW, PHH, 6-32 x 3/8	
8	47010402	AIR BAFFLE AND SEAL ASSEMBLY	
9	94241019	CLIP, Cable	
10	Spare	RAIL, Lower	
11	47009110	PLATE, Rail, Lower	
12	93263401	SPRING, Torsion	
13	93263402	ARM, Carriage Lock	
14	92033004	RETAINER, Ring	
15	75038338	PLATE, Rail, Upper	
16	Spare	RAIL, Upper	
17	94376729	PLATE, Nut	See Note 2
18	92001704	SCREW W/WASHER, 6-32 x 3/8	
	81853300	INTERLOCK CABLE ASSEMBLY	See Note 1
19	10127313	SCREW, PHH, 2-56 x 3/8	
20	94364400	SWITCH	
21	93263405	BRACKET, Switch	
	81853301	INTERLOCK CABLE ASSEMBLY	See Note 2
22	15187601	SCREW, Self-Lkg, 2-56 x 3/16	
23	10127315	SCREW, PHH, 2-56 x 5/8	
24	94141019	SWITCH	
25	95138470	BRACKET, Switch	
26	93148617	PAD, Insulating	
	81853302	INTERLOCK CABLE ASSEMBLY	See Note 3
27	10127315	SCREW, PHH, 2-56 x 5/8	
28	94141020	SWITCH	
29	95138472	BRACKET, Switch	
30	93148617	PAD, Insulating	

Note 1: Used on units S/C 09 & blw.

Note 2: Used on units S/C 10-18, and units with ECO 03518 installed.

Note 3: Used on units S/C 19 & abv, and units with ECO 03881 installed.

TABLE 4-1. OPTIONAL PARTS

PART NO.	PART DESCRIPTION	EQUIPMENT PACKAGE 957654xx												
		00	01	03	05	07	08	09	10	11	12	13	14	15
72860001	PA3A1A DRIVE	XX		XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
72860002	PA3A2A DRIVE		XX											
75168323	AC CABLE (P01)	XX	XX		XX			XX		XX		XX	XX	
75168324	AC CABLE (P01)			XX		XX	XX		XX		XX			XX
93991802	DC CABLE (P40)	XX					XX					XX		
92081500	DC CABLE (P40)		XX	XX					XX	XX			XX	XX
92081501	DC CABLE (P40)				XX	XX		XX			XX			
73157938	SLIDE ASSY, LH	XX	XX	XX	XX	XX	XX				XX	XX		XX
73157939	SLIDE ASSY, RH	XX	XX	XX	XX	XX	XX				XX	XX		XX
92723680	MOUNT, LH	XX	XX	XX	XX	XX	XX				XX	XX		XX
92723681	MOUNT, RH	XX	XX	XX	XX	XX	XX				XX	XX		XX
93402700	BRACKET, Mtg	XX	XX	XX	XX	XX	XX				XX	XX		XX
94369549	GROUND CABLE						XX					XX		
93270700	TERMINATOR									XX	XX			XX
95243715	FR DOOR ASSY	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
94397021	PRODUCT EMBLEM	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
94474300	PANEL, Insert	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

Table Continued on Next Page

TABLE 4-1. OPTIONAL PARTS (Contd)

PART NO.	PART DESCRIPTION	EQUIPMENT PACKAGE 957654xx												
		16	17	18	19	20	21	22	23	24	25	26	27	28
72860001	PA3A1A DRIVE	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
75168323	AC CABLE (P01)	XX			XX		XX		XX		XX			
75168324	AC CABLE (P01)		XX	XX		XX		XX		XX		XX		
93991802	DC CABLE (P40)						XX	XX	XX	XX	XX	XX	XX	XX
92081500	DC CABLE (P40)	XX	XX											
92081501	DC CABLE (P40)			XX	XX	XX								
73157938	SLIDE ASSY, LH	XX							XX	XX			XX	
73157939	SLIDE ASSY, RH	XX							XX	XX			XX	
92723680	MOUNT, LH	XX						XX	XX	XX				
92723681	MOUNT, RH	XX						XX	XX	XX				
93402700	BRACKET, Mtg	XX						XX	XX	XX				
94369549	GROUND CABLE						XX	XX	XX	XX	XX	XX	XX	XX
93270700	TERMINATOR	XX	XX		XX	XX			XX	XX	XX	XX	XX	XX
95243715	FR DOOR ASSY	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
94397021	PRODUCT EMBLEM	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
94474300	PANEL, Insert	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

Table Continued on Next Page

TABLE 4-1. OPTIONAL PARTS (Contd)

PART NO.	PART DESCRIPTION	EQUIPMENT PACKAGE 957654xx												
		29	30	31	32	33	34	35	36	37	38	39	40	41
72860001	PA3A1A DRIVE	XX		XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
72860002	PA3A2A DRIVE		XX											
93991802	DC CABLE (P40)	XX	XX											
92081500	DC CABLE (P40)			XX	XX	XX								
92081501	DC CABLE (P40)						XX	XX	XX	XX				
73157938	SLIDE ASSY, LH	XX		XX	XX		XX		XX			XX		XX
73157939	SLIDE ASSY, RH	XX		XX	XX		XX		XX			XX		XX
94369549	GROUND CABLE	XX	XX											
93270700	TERMINATOR			XX			XX	XX		XX			XX	XX
95243715	FR DOOR ASSY	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
94397021	PRODUCT EMBLEM	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX
94474300	PANEL, Insert	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX

Table Continued on Next Page

TABLE 4-1. OPTIONAL PARTS (Contd)

PART NO.	PART DESCRIPTION	EQUIPMENT PACKAGE 957654xx												
		42	43	44	45	46	47	48	55	56	57	58	59	60
72860001	PA3A1A DRIVE	XX	XX	XX	XX				XX	XX	XX	XX		XX
72860005	PA3A1B DRIVE					XX								
72860006	PA3A1E DRIVE						XX							
72860007	PA3A2E DRIVE							XX						
72860008	PA3A2G DRIVE												XX	
75168323	AC CABLE (P01)		XX	XX							XX	XX		XX
75168324	AC CABLE (P01)				XX				XX	XX				
75168325	AC CABLE (P01)						XX	XX						
93991802	DC CABLE (P40)			XX	XX	XX							XX	XX
92081500	DC CABLE (P40)	XX		XX	XX		XX	XX		XX	XX			
92081501	DC CABLE (P40)		XX	XX	XX				XX			XX		
73157938	SLIDE ASSY, LH		XX	XX	XX		XX	XX						XX
81737590	SLIDE ASSY, LH								XX	XX	XX	XX		
73157939	SLIDE ASSY, RH		XX	XX	XX		XX	XX						XX
81737591	SLIDE ASSY, RH								XX	XX	XX	XX		
92723680	MOUNT, LH		XX	XX	XX		XX	XX	XX	XX	XX	XX		XX
92723681	MOUNT, RH		XX	XX	XX		XX	XX	XX	XX	XX	XX		XX
93402700	BRACKET, Mtg		XX	XX	XX		XX	XX	XX	XX	XX	XX		XX
94369549	GROUND CABLE			XX	XX	XX							XX	
81244505	DR MTG KIT													XX
92678803	FILLER PAN KIT													XX
70504403	"A" CABLE, Ext			XX	XX									
70505003	"B" CABLE, Ext			XX	XX									
93270700	TERMINATOR	XX	XX	XX	XX		XX	XX	XX	XX	XX	XX		
95243715	FR DOOR ASSY	XX	XX	XX	XX				XX	XX	XX	XX		
95243718	FR DOOR ASSY						XX	XX						
95243719	FR DOOR ASSY					XX							XX	
95243720	FR DOOR ASSY													XX
94397021	PRODUCT EMBLEM	XX	XX	XX	XX		XX	XX	XX	XX	XX	XX		XX
94474300	PANEL, Insert	XX	XX	XX	XX				XX	XX	XX	XX		
94474303	PANEL, Insert						XX	XX						
94474304	PANEL, Insert					XX							XX	
94474305	PANEL, Insert													XX

Table Continued on Next Page

TABLE 4-1. OPTIONAL PARTS (Contd)

PART NO.	PART DESCRIPTION	EQUIPMENT PACKAGE 957654xx													
		64	66	67	69										
72860001	PA3A1A DRIVE	XX	XX	XX	XX										
75168300	AC CABLE (P01)														
75168323	AC CABLE (P01)			XX											
75168324	AC CABLE (P01)	XX			XX										
75168347	AC CABLE (P01)		XX												
92081500	DC CABLE (P40)	XX													
92081510	DC CABLE (P40)		XX	XX	XX										
73157938	SLIDE ASSY, LH		XX												
81737590	SLIDE ASSY, LH	XX		XX	XX										
73157939	SLIDE ASSY, RH		XX												
81737591	SLIDE ASSY, RH	XX		XX	XX										
92723680	MOUNT, LH	XX	XX	XX	XX										
92723681	MOUNT, RH	XX	XX	XX	XX										
93402700	BRACKET, Mtg	XX	XX	XX	XX										
93270700	TERMINATOR			XX											
95243715	FR DOOR ASSY	XX		XX	XX										
95243721	FR DOOR ASSY		XX												
94397021	PRODUCT EMBLEM	XX		XX	XX										
94474300	PANEL, Insert	XX		XX	XX										
94474306	PANEL, Insert		XX												

Table Continued on Next Page

TABLE 4-1. OPTIONAL PARTS (Contd)

PART NO.	PART DESCRIPTION	EQUIPMENT PACKAGE 952807xx												
		00	01	02	03	06	07	08	09	10	11	12	13	15
94093601	PA3A1C DRIVE	XX				XX	XX	XX	XX	XX				XX
94093603	PA3A1D DRIVE			XX										
94093608	PA3A1J DRIVE											XX		
94093607	PA3A2B DRIVE										XX			
94093602	PA3A2C DRIVE		XX										XX	
94093604	PA3A2D DRIVE				XX									
75168323	AC CABLE (P01)	XX	XX			XX						XX	XX	XX
75268324	AC CABLE (P01)						XX	XX	XX		XX		XX	
75168325	AC CABLE (P01)			XX	XX									
73157938	SLIDE ASSY, LH	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX		XX	
73157939	SLIDE ASSY, RH	XX	XX	XX	XX	XX	XX	XX	XX	XX	XX		XX	
93270700	TERMINATOR			XX	XX	XX		XX	XX	XX		XX	XX	
95243715	FR DOOR ASSY	XX	XX			XX	XX	XX	XX					XX
95243718	FR DOOR ASSY			XX	XX									
95243721	FR DOOR ASSY									XX				
95243723	FR DOOR ASSY										XX			
95243724	FR DOOR ASSY											XX		
95243726	FR DOOR ASSY												XX	
94397021	PRODUCT EMBLEM	XX	XX			XX	XX	XX	XX					XX
94474300	PANEL, Insert	XX	XX			XX	XX	XX	XX					XX
94474303	PANEL, Insert			XX	XX									
94474306	PANEL, Insert									XX				
94474308	PANEL, Insert										XX			
94474309	PANEL, Insert											XX		
94474311	PANEL, Insert												XX	

Table Continued on Next Page

TABLE 4-1. OPTIONAL PARTS (Contd)

	PART	EQUIPMENT PACKAGE 952807xx												
PART NO.	DESCRIPTION	16	17	18	20	21	22	23	24	25				
94093601	PA3A1C DRIVE	XX	XX						XX	XX				
94093610	PA3A1K DRIVE			XX										
94093612	PA3A1L DRIVE				XX									
94093613	PA3A1M DRIVE					XX								
94093614	PA3A1N DRIVE						XX							
94093615	PA3A1P DRIVE							XX						
75168315	AC CABLE (P01)				XX									
75168323	AC CABLE (P01)					XX	XX	XX	XX					
75168329	AC CABLE (P01)	XX												
75168330	AC CABLE (P01)		XX											
73157938	SLIDE ASSY, LH	XX	XX	XX	XX			XX	XX	XX				
73157939	SLIDE ASSY, RH	XX	XX	XX	XX			XX	XX	XX				
93270700	TERMINATOR			XX	XX		XX		XX	XX				
95243715	FR DOOR ASSY							XX						
95243721	FR DOOR ASSY				XX				XX	XX				
95243724	FR DOOR ASSY						XX							
95243727	FR DOOR ASSY	XX	XX											
95243728	FR DOOR ASSY			XX										
95243729	FR DOOR ASSY					XX								
94397021	PRODUCT EMBLEM				XX			XX						
94474300	PANEL, Insert				XX			XX						
94474306	PANEL, Insert								XX	XX				
94474309	PANEL, Insert						XX							
94474312	PANEL, Insert	XX	XX											
94474313	PANEL, Insert			XX										
94474315	PANEL, Insert					XX								

TABLE 4-2. MANUFACTURER'S RECOMMENDED SPARE PARTS

DESCRIPTION/NOTES	PART NUMBER	REPLACEMENT PART NUMBER
POWER SUPPLY ASSEMBLY, Remote		
S/C 04 & Blw	72896501	72896504
S/C 05-07	72896502	72896504
S/C 08-13	72896503	72896504
S/C 14-18		
All except PA3A1B, PA3A1G	72896503	72896504
PA3A1B, PA3A1G	72896504	72896504
S/C 19 & Abv	72896504	72896504
READ/WRITE PLO BOARD (2-Board R/W)		
DPGX--S/C 03 & Blw	54332904	46604101+
FPGX--S/C 04-06	54332906	46604101+
GPGX--S/C 07-16	54332907	46604101+
DATA LATCH BOARD (2-Board R/W)		
BPFX--S/C 03 & Blw	54332501	46604101+
CPFX--S/C 04-16	54332503	46604101+
R/W PLO & DATA LATCH BOARD (1-Board R/W)		
ALL EXCEPT PA3A1M/PA3A1P		
ARUX--S/C 17	54356900	54356908
CRUX--S/C 18-22	54356902	54356908
JRUX--S/C 23 & Abv	54356908	54356908
PA3A1M		
ARUX--S/C 17	54356900	54356911
CRUX--S/C 18-22	54356902	54356911
JRUX--S/C 23-24	54356908	54356911
MRUX--S/C 24 & Abv	54356911	54356911
PA3A1P		
ERUX--S/C 20-22	54356904	54356910
LRUX--S/C 23 & Abv	54356910	54356910
POWER AMP (BPDX) BOARD	54331701	54331701
CONTROL BOARD		
BPEX--S/C 05 & Blw	54332101	54332108
DPEX--S/C 06-11	54332103	54332108
FPEX--S/C 12-22	54332105	54332108
HPEX--S/C 22 & 24	54332107	54332108
JPEX--S/C 24 & Abv	54332108	54332108

+2-Board Read/Write Replacement Kit (includes JRUX board and necessary hardware for installation).

Table Continued on Next Page

TABLE 4-2. MANUFACTURER'S RECOMMENDED SPARE PARTS (Contd)

DESCRIPTION/NOTES	PART NUMBER	REPLACEMENT PART NUMBER
I/O BOARD (Single Channel)		
BEBN/CEBN/EEBN/FEBN Replacement Kit		
Remote Power Supply Drives		45424201*
Integral Power Supply Drives		45424200*
GEBN--S/C 14-15	54020507	54020510
KEBN--S/C 16 & Abv	54020510	54020510
I/O BOARD (Dual Channel)		
AEDN--Remote Pwr Sup S/C 22 & Blw Units	54021300	45424205¢
CEDN--Integral Pwr Sup S/C 22 & Blw Units	54021302	45424206¢
DEDN--S/C 22 & Abv	54021304	54021304
CABLE ASSEMBLY (P14/P20)		
Single Channel Drives	95276300	95276300
Dual Channel Drives	95276301	95276301
CABLE ASSEMBLY (P28/P34)	81243100	81243100
FILTER, Absolute	72868200	72868200
MOTOR SPEED CONTROL (CPMX) BOARD	54334902	54334902
FAN ASSEMBLY		
S/C 05 & Blw	81235100	81235100
S/C 06 & Abv, & units with ECO 03308 installed	81235101	81235101
POWER SUPPLY ASSEMBLY, Integral		
Longer Type	81542300	81542300 or 81542304#
Shorter Type (older)	81542301	81542304
Shorter Type (newer)	81542304	81542304
DC HARNESS		
Remote Power Supply Drives (P19/P21/P22/P36/P37/J40)		
S/C 05 & Blw	93151301	93151301
S/C 06-16, and units with ECO 03308 installed	93151302	93151302
S/C 17 & Abv, and units with ECO 03811 installed	93151307	93151307
Integral Power Supply Drives (P15/P19/P21/P22/P36/P37)		
S/C 16 & Blw	93151305	93151305
S/C 17 & Abv, and units with ECO 03811 installed	93151309	93151309

*Includes KEBN I/O board, internal A and B cables, and I/O plate assembly.
¢Includes DEDN I/O board and internal A and B cables.
#Power Supply Replacement Kit, P/N 45776801, is also required.

Table Continued on Next Page

TABLE 4-2. MANUFACTURER'S RECOMMENDED SPARE PARTS (Contd)

DESCRIPTION/NOTES	PART NUMBER	REPLACEMENT PART NUMBER
OPERATOR PANEL ASSEMBLY		
CPBX Replacement Kit (includes GPBX operator panel assembly, logic plugs 0 thru 7, lenses, shield and bracket)	54330902	40148200
GPBX--S/C 12 & Abv	54330906	54330906
FILTER, Primary	72852572	72852572
SWITCH	94364400	94364400
SOLENOID, DC	83292733	83292733
SPINDLE ASSEMBLY		
S/C 08 & Blw w/o ECO 03465 installed	72860101	45140900@
S/C 09 & Abv, & units with ECO 03465 installed	72860102	72860102
GROUND SPRING, Spindle	72865600	72865600
MOTOR AND CABLE ASSEMBLY	94231900	94231900
R/W PREAMP (CPCX) BOARD	54331302	54331302
CARRIAGE ASSEMBLY	72860201	72860201
COIL AND LEAD ASSEMBLY	72863000	72863000
SCREW, Head Arm	75017506	75017506
HEAD ARM ASSEMBLY, Servo	92773402	92773402
HEAD ARM ASSEMBLY, Data Top	92773401	92773401
HEAD ARM ASSEMBLY, Data Bottom	92773400	92773400
SERVO PREAMP (BUUN) BOARD	54007301	54007301
RAIL, Lower	72862800	72862800
RAIL, Upper	72862600	72862600

@Spindle Assembly Replacement Kit, which includes new shields, spindle assembly, and pack receiver support ring.

TABLE 4-3. ACCESSORIES

PART NUMBER	DESCRIPTION
--------	DATA PACK (contact your Imprimis account sales representative for part numbers)
93991802	DC POWER CABLE, 1 foot (0.3 metre) long
92081500	DC POWER CABLE, 5 foot (1.5 metre) long
92081501	DC POWER CABLE, 8 foot (2.4 metre) long
81244502	DRIVE MOUNTING KIT (for mounting drive in a standard rack)
40125601	GROUND LUG
24534808	GROUND STRAP, 9/16 inch wide (specify length desired)
70504401	I/O A CABLE, 5 foot (1.5 metre) long
70504402	I/O A CABLE, 10 foot (3.0 metre) long
70504403	I/O A CABLE, 15 foot (4.5 metre) long
70504404	I/O A CABLE, 20 foot (6.1 metre) long
70504405	I/O A CABLE, 25 foot (7.6 metre) long
70504406	I/O A CABLE, 30 foot (9.1 metre) long
70504407	I/O A CABLE, 40 foot (12.2 metre) long
70504408	I/O A CABLE, 50 foot (15.3 metre) long
70504409	I/O A CABLE, 100 foot (30.6 metre) long
70505001	I/O B CABLE, 5 foot (1.5 metre) long
70505002	I/O B CABLE, 10 foot (3.0 metre) long
70505003	I/O B CABLE, 15 foot (4.5 metre) long
70505004	I/O B CABLE, 20 foot (6.1 metre) long
70505005	I/O B CABLE, 25 foot (7.6 metre) long
70505006	I/O B CABLE, 30 foot (9.1 metre) long
70505007	I/O B CABLE, 40 foot (12.2 metre) long
70505008	I/O B CABLE, 50 foot (15.3 metre) long
93270700	I/O TERMINATOR
10126403	LOCKWASHER, #10 (for grounding)
94398817	LOGIC PLUG "0" (See Note 1)
94398818	LOGIC PLUG "1" (See Note 1)
94398819	LOGIC PLUG "2" (See Note 1)
94398820	LOGIC PLUG "3" (See Note 1)
94398821	LOGIC PLUG "4" (See Note 1)
94398822	LOGIC PLUG "5" (See Note 1)
94398823	LOGIC PLUG "6" (See Note 1)
94398824	LOGIC PLUG "7" (See Note 1)
15181751	LOGIC PLUG "0" (See Note 2)
15181752	LOGIC PLUG "1" (See Note 2)
15181753	LOGIC PLUG "2" (See Note 2)
15181754	LOGIC PLUG "3" (See Note 2)
15181755	LOGIC PLUG "4" (See Note 2)
15181756	LOGIC PLUG "5" (See Note 2)
15181757	LOGIC PLUG "6" (See Note 2)
15181758	LOGIC PLUG "7" (See Note 2)
15181663	LOGIC PLUG "8" (See Note 3)
15181664	LOGIC PLUG "9" (See Note 3)

TABLE 4-3. ACCESSORIES (Contd)

PART NUMBER	DESCRIPTION
15181665	LOGIC PLUG "10" (See Note 3)
15181666	LOGIC PLUG "11" (See Note 3)
15181667	LOGIC PLUG "12" (See Note 3)
15181668	LOGIC PLUG "13" (See Note 3)
15181669	LOGIC PLUG "14" (See Note 3)
15181670	LOGIC PLUG "15" (See Note 3)
12263496	STATIC GROUND WRIST STRAP, 6 1/2 to 8 inch wrist
12263623	STATIC GROUND WRIST STRAP, up to 6 1/2 inch wrist
12263624	STATIC SHIELDING BAG, 5 x 8 inch
12263625	STATIC SHIELDING BAG, 8 x 12 inch
12263626	STATIC SHIELDING BAG, 10 x 12 inch
12263499	STATIC SHIELDING BAG, 14 x 18 inch
12263627	STATIC SHIELDING BAG, 16 x 24 inch

Note 1: Used on older operator panels, which have logic plugs without indicator lights.

Note 2: Used on newer operator panels, which have logic plugs with indicator lights.

Note 3: Can be used only on units with HPEX control board and DEDN I/O board.

ANHANG A

INSTALLATIONS- UND BETRIEBSERFORDERNISSE

INSTALLATIONS- UND BETRIEBSERFORDERNISSE A

EINLEITUNG

Dieser Anhang enthält Informationen für gefahrlose(n) Anschluß, Betrieb und Wartung des Laufwerks.

SICHERHEITSHINWEISE

- Um die Zuverlässigkeit der im Laufwerk eingebauten Sicherheitseinrichtungen zu gewährleisten, darf die Installation und Wartung des Gerätes nur von qualifiziertem Wartungspersonal unter Verwendung von Original-Imprimis-Ersatzteilen durchgeführt werden.

- Beim Ausbrechen von Feuer oder in anderen Notfällen ist die Verbindung zum Hauptstromnetz durch das Ziehen des Netzsteckers aus der Steckdose zu unterbrechen. Sollte dies nicht möglich oder unpraktisch sein, so ist der Hauptstromunterbrecher des Systems zu bedienen, um die Laufwerke vom Hauptstromnetz zu trennen.

- Wenn das Laufwerk in einem Geräteeinschub oder Gehäuse montiert ist, versichern Sie sich, daß die Temperatur im Einschub oder Gehäuse die in diesem Handbuch festgelegten Werte nicht überschreitet. Sind Geräte übereinander angeordnet, achten Sie besonders auf das obere Gerät, da dort die Temperatur gewöhnlich am höchsten ist.

- Das Gerät ist konstruiert zum Anschluß und Betrieb in Übereinstimmung mit IEC380, IEC435, VDE805 und VDE806.

- Wird das Laufwerk mit einem empfohlenen Imprimis-Netzgerät betrieben im Anschluß an ein Netz, das keine direkte Erdung hat (IT-Netz), ist die Eingangsspannung des Netzgeräts wie folgt zu begrenzen:

  - Bei Netzgeräten mit den Nummern 81542300 bis 81542302 oder 72896500 bis 72896503 auf 230V Wechselspannung.

  - Bei anderen empfohlenen Imprimis-Netzgeräten auf 240V Wechselspannung.

- Falls kein empfohlenes Imprimis Netzgerät verwendet wird, stellen Sie bitte sicher, daß das Netzgerät den Spezifikationen in diesem Manual entspricht und konstruiert ist für den Betrieb entsprechend IEC380, IEC435, VDE805 und VDE806.

ANSCHLUSS-ERFORDERNISSE

Der Installationsort muß dem in den folgenden Tabellen und Skizzen dargelegten Vorschriften entsprechen:

TABELLE A-1. UMGEBUNGSBEDINGUNGEN

TEMPERATUR	BEREICH	MAX. ÄNDERUNGSWERT
im Stillstand (unverpackt)	-10 bis 50°C	15°C / h
Lagerung/Transit (verpackt)	-40 bis 60°C	20°C / h
in Betrieb	10 bis 45°C	10°C / h
RELATIVE FEUCHTE		
im Stillstand (unverpackt)	10% bis 90% (keine Kondensation erlaubt)	
Lagerung/Transit (verpackt)	5% bis 95% (keine Kondensation erlaubt)	
in Betrieb	20% bis 80% mit 10% Änderung pro Stunde (keine Kondensation erlaubt)	
ATMOSPHÄRENDRUCK	-300 m bis 3000 m oder 105 kPa bis 69 kPa	

TABELLE A-2. ERFORDERNISSE FÜR EL. ANSCHLUSS

SPEZIFIKATION	WERTE	
	100/120 V GERÄT	208/240 V GERÄT
Spannungsbereich	87 bis 128 V	179 bis 256 V
Nominale Netz-Frequenz	50/60 Hz	50/60 Hz
Frequenzbereich	48,0 bis 62,0 Hz	48,0 bis 62,0 Hz
Phase	einphasig	einphasig
Leistungsbedarf*		
integriertes Netzgerät	0,237 kW	0,241 kW
separates Netzgerät	0,244 kW	0,236 kW
Stromaufnahme*		
integriertes Netzgerät	3,5 A	2,1 A
separates Netzgerät	2,8 A	1,6 A
Phasenwinkel *Cos phi		
integriertes Netzgerät	0,68	0,56
separates Netzgerät	0,73	0,69
Anlaufstrom	siehe Abbildung A-1	siehe Abbildung A-1

* gemessen bei rotierendem Plattenstapel und Kopfschlitten in Bewegung.

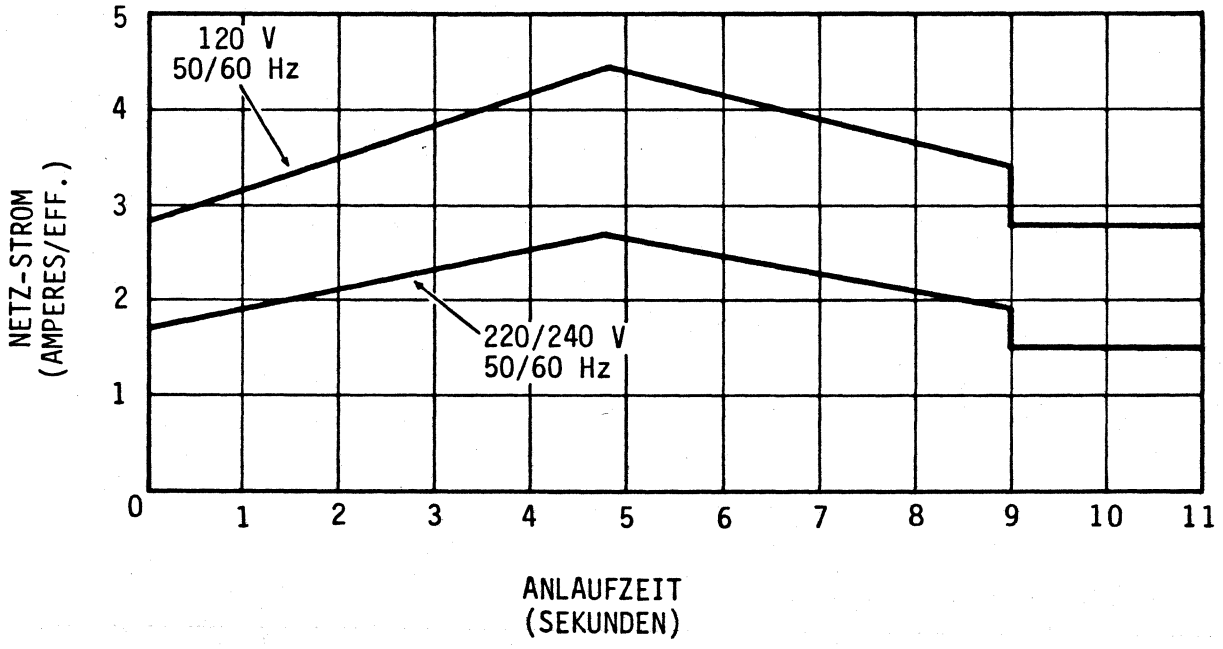


Abbildung A-1. Typischer Anlaufstrom im Verhältnis zur Zeit

BETRIEBSANLEITUNG

EINSCHALTSEQUENZ

1. Am Netzgerät Schalter ON/STANDBY (CB1 an einigen Geräten) auf ON stellen.

2. Sicherstellen, daß Datenkassette eingeschoben und die Fronttür geschlossen ist.

3. START-Schalter niederdrücken, um in START-Position zu rasten.

   - Wurde der LOCAL/REMOTE-Schalter während des Installationsvorganges auf "LOCAL" gestellt, beginnt die Einschaltsequenz unmittelbar.

   - Wurde der LOCAL/REMOTE-Schalter während der Installation auf "REMOTE" gestellt, wartet das Laufwerk auf ein entsprechendes Signal des Kontrollers zum Start der Einschaltsequenz.

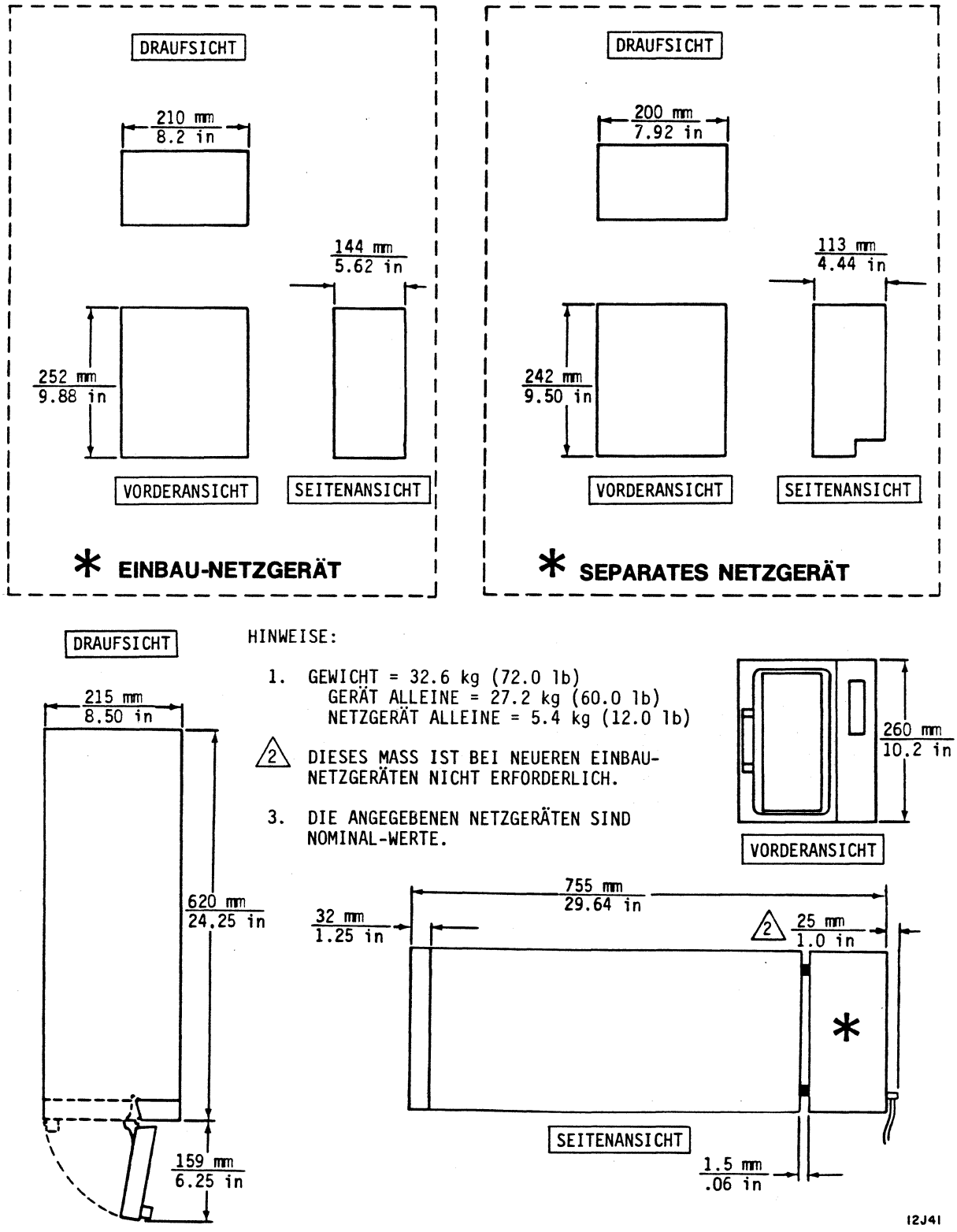


Abbildung A-2. Abmessungen und Gewicht des Laufwerks

4. Die Bereitschaftsanzeige (im START-Schalter integriert) blinkt, um den Ablauf der Einschaltsequenz anzuzeigen.

5. Innerhalb von 60 sec wechselt die Bereitschaftsanzeige von Blink- auf Dauerlicht, nachdem das Laufwerk Nenndrehzahl erreicht hat und die Magnetköpfe eingefahren sind.

6. Die FAULT-Anzeige muß unbeleuchtet sein, zum Zeichen, daß kein Fehler auftrat und das Gerät zum Lesen oder Schreiben von Daten bereit ist.

AUSSCHALTSEQUENZ

1. START-Schalter drücken, um aus der START-Position auszurasten. Wurde während des Installationsvorganges LOCAL/REMOTE-Schalter auf "REMOTE" gestellt, kann der Kontroller das Laufwerk durch entsprechendes Signal veranlassen, die Ausschaltsequenz zu starten (START-Schalter braucht nicht gedrückt zu werden).

2. Die Bereitschaftsanzeige (im START-Schalter integriert) blinkt, solange die Ausschaltsequenz abläuft.

3. Die Bereitschaftsanzeige erlischt nach etwa 35 sec, was den Abschluß der Ausschaltsequenz anzeigt. Die Magnetköpfe sind abgehoben und die Spindelrotation kam zum Stillstand.

4. Zur Unterbrechung des Gleichstromanschlusses zum Laufwerk ist der Schalter ON/STANDBY am Netzgerät auf STANDBY (Sicherungsautomat CB1 auf OFF) zu schalten.

APPENDICE B

INSTRUCTIONS D'INSTALLATION ET DE FONCTIONNEMENT

INSTRUCTIONS D'INSTALLATION ET DE FONCTIONNEMENT B

INTRODUCTION

Cet appendice contient les informations sécuritaires indispensables pour l'installation, le fonctionnement et la maintenance de l'appareil.

INFORMATION DE SECURITE

- Afin d'assurer l'intégralité des conditions sécuritaires installées dans l'appareil, l'installation et la maintenance doivent être accomplies exclusivement par un personnel qualifié utilisant des pièces recommandées Imprimis.

- En cas d'incendie ou autres états d'urgence, isolez l'appareil de la source de courant en retirant la fiche secteur de la prise de courant. Pour les situations ou il n'est pas possible ou praticable de retirer la fiche, utilisez la déconnection générale du système pour isoler les appareils de la source de courant.

- Si l'appareil est monté en rack ou en armoire, assurez-vous que la température interne du rack ou de l'armoire ne dépasse pas les limites définies pour l'appareil. Lorsque les appareils sont empilés verticalment, portez votre attention sur la partie supérieure du rack ou de l'armoire où les températures sont généralement plus élevées.

- Cet appareil est concu pour être installé et de fonctionner en accordance avec IEC380, IEC435, VDE805 et VDE806.

- Si l'appareil utilise une alimentation recommandée Imprimis et est branché à réseau sans prise de terre directe (réseaux IT), limitez la tension d'entrée de l'alimentation comme suit:

  - Pour les alimentations depuis le numéro 81542300 jusqu'au numéro 81542302, ou du numéro 72896500 jusqu'au numéro 72896503, limitez la tension alternative à 230V.

  - Pour les autres alimentations recommendées Imprimis, limitez la tension alternative à 240V.

- Si vous n'utilisez pas une alimentation recommandée Imprimis, assurez vous que l'alimentation soit conforme aux spécifications de ce manuel et qu'elle soit concue pour être utilisée en accordance avec IEC380, IEC435, VDE805 et VDE806.

CONDITIONS D'INSTALLATION

Le lieu d'installation doit être conforme aux spécifications données dans les tableaux et figures suivants.

TABLEAU B-1. CONDITIONS DE L'ENVIRONNEMENT

TEMPERATURE	MARGE	FLUCTUATION MAXIMALE
Hors service (Déballée)	-10 à 50°C	15°C par heure
Stockage/Transport (Emballée)	-40 à 60°C	20°C par heure
En service	+10 à 45°C	10°C par heure
HUMIDITE RELATIVE		
Hors service (Déballeé)	10% à 90% (pas de condensation autorisée)	
Stockage/Transport (Emballée)	5% à 95% (pas de condensation autorisée)	
En service	20% à 80% avec une fluctuation de 10% par heure (pas de condensation autorisée)	
PRESSION BAROMETRIQUE	-300 m à 3000 m ou 104 kPa à 69 kPa	

TABLEAU B-2. EXIGENCES POUR L'ALIMENTATION

SPECIFICATIONS	VALEURS	
	Appareils de 100/120 V	Appareils de 208/240 V
Marge de tension	87 à 128 V	179 à 256 V
Fréquence nominale du réseau	50/60 Hz	50/60 Hz
Marge de fréquence	48.0 à 62.0 Hz	48.0 à 62.0 Hz
Phase éxigée	Monophasé	Monophasé
Puissance consomée*		
Alimentation intégrée	0.237 kW	0.241 kW
Alimentation séparée	0.244 kW	0.236 kW
Courant au réseau*		
Alimentation intégrée	3.5 A	2.1 A
Alimentation séparée	2.8 A	1.6 A
Cosinus Phi*		
Alimentation intégrée	0.68	0.56
Alimentation séparée	0.73	0.69
Courant de mise en route	voir figure B-1	voir figure B-1

* Mesuré lorsque les disques sont en rotation et que le chariot soit en mouvement.

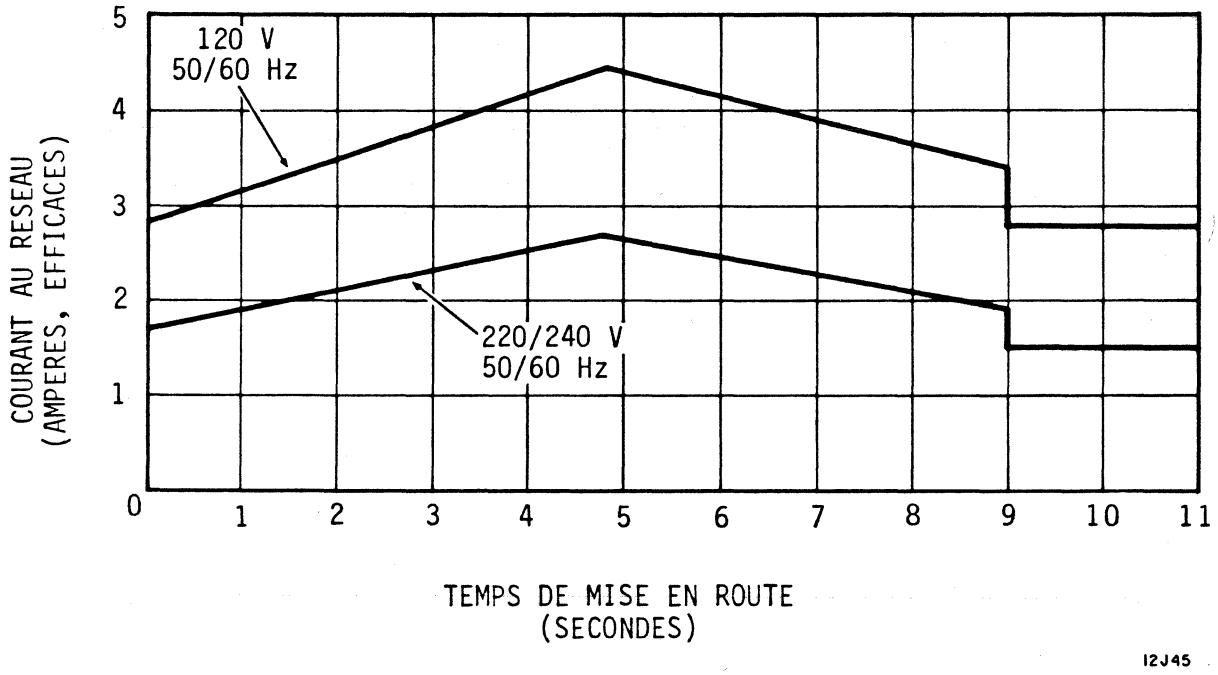


Figure B-1. Courant typique par rapport au temps de mise en route

INSTRUCTIONS DE FONCTIONNEMENT

PROCEDURE DE MISE EN ROUTE

1. Placez l'interrupteur On/Standby de l'alimentation (CB1 sur certains appareils) sur ON.

2. Assurez-vous qu'un "Module de disques" soit installé et que la porte frontale soit fermée.

3. Pressez l'interrupteur START afin de le bloquer en position Start.

   - Si le commutateur LOCAL/REMOTE à été placé sur LOCAL à l'installation, la séquence de mise en route démarre aussitôt.

   - Si le commutateur LOCAL/REMOTE à été placé sur REMOTE à l'installation, la séquence est retardée jusqu'a ce que l'appareil recoive le signal approprié du contrôleur.

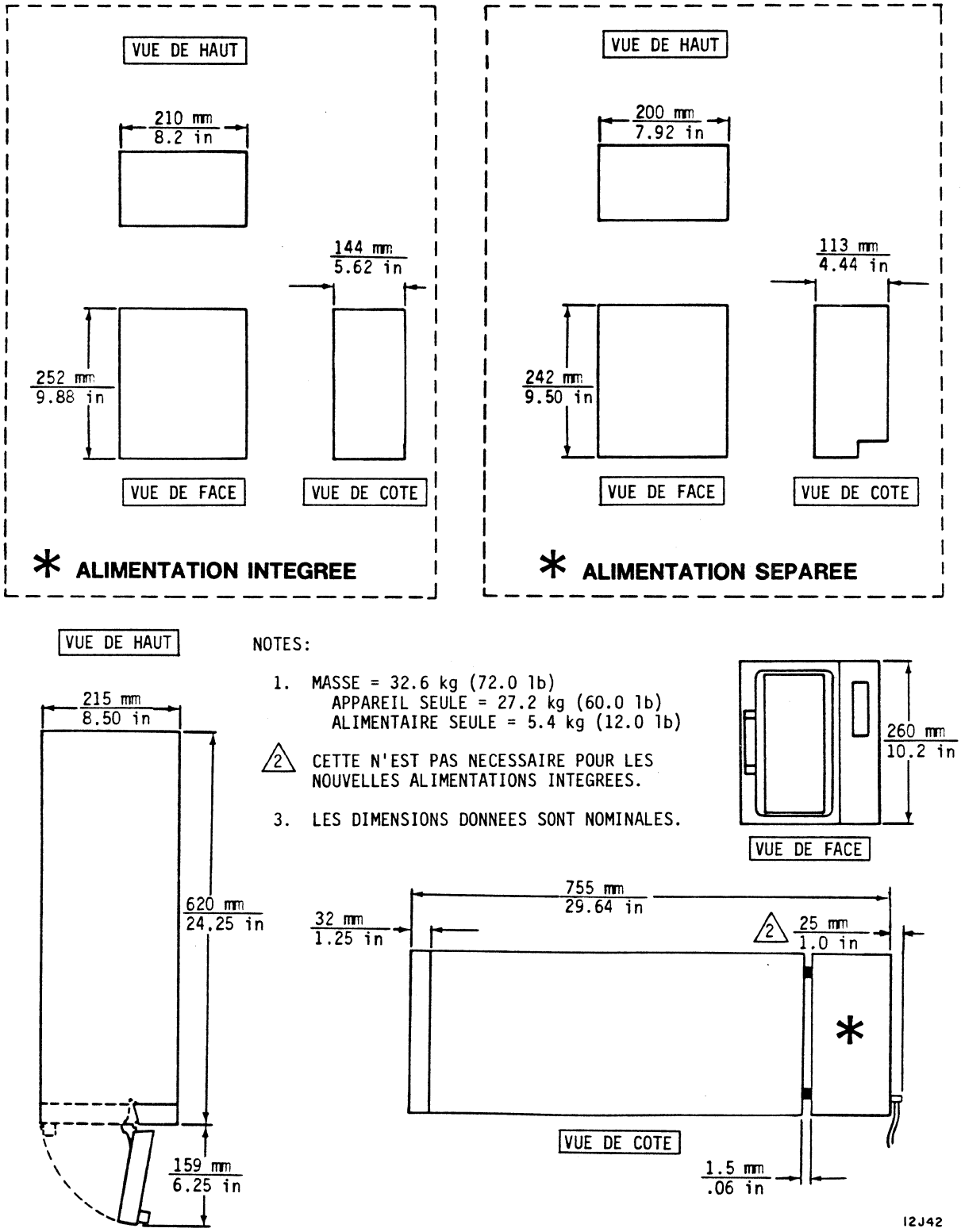


Figure B-2. Dimensions et poids des appareils

4. Observez que l'indicateur READY (placé dans l'interrupteur START) clignote pour signaler que la séquence de mise en route est en progression.

5. Observez que l'indicateur READY luise continuellement dans un délai de 60 secondes pour signaler que les disques ont atteints leur vitesse nominale et que les têtes sont chargées.

6. Observez que l'indicateur FAULT soit éteint pour signaler l'absence d'erreurs et que l'appareil est prêt à lire ou écrire des données.

PROCEDURE D'ARRET

1. Pressez l'interrupteur START afin de le dégager de la position Start. Si le commutateur START/REMOTE à été placé sur REMOTE à l'installation, le contrôleur peut signaler à l'appareil de démarrer la séquence d'arrêt (il n'est pas nécessaire de presser l'interrupteur START).

2. Observez que l'indicateur READY (placé dans l'interrupteur START) clignote pour signaler que la séquence d'arrêt est en progression.

3. Observez que l'indicateur READY s'éteigne après environ 35 secondes pour signaler que la séquence d'arrêt est complète. Les têtes sont maintenant déchargées et les disques ne sont pas en rotation.

4. Retirez la tension continue de l'appareil en placant l'interrupteur On/Standby sur Standby (CB1 sur OFF).

APENDICE C

REQUISITOS DE INSTALACION Y OPERACION

REQUISITOS DE INSTALACION Y OPERACION C

INTRODUCCION

Este apéndice contiene información pertinente a la instalación, operación y mantenimiento seguro del disco.

INFORMACION DE SEGURIDAD

- Para asegurar la integridad de las características de seguridad integradas en el disco, la instalación y el mantenimiento deben ser realizadas solamente por personal de servicio cualificado utilizando solamente piezas originales de Imprimis.

- En caso de fuego u otra emergencia, aislar el disco de la fuente principal de energía, desenchufando el cable de corriente del disco de la salida de corriente alterna. En situaciones donde quitar el enchufe no es posible ni práctico, utilize el sistema de desconexión principal para aislar los discos de las fuentes de energía.

- Cuando el disco está montado en un estante de equipos o en un armario, asegúrese de que la temperatura interna del armario no sobrepase los límites definidos para el disco. Cuando las unidades están almacenadas verticalmente, preste particular atención a la parte superior donde las temperaturas son normalmente más altas.

- Este disco está diseñado para ser instalado y operado de acuerdo a las normas IEC380, IEC435, VDE805 y VDE806.

- Si el disco utiliza una fuente de alimentación recomendada por Imprimis y toma energía de un circuito que no tiene conexión directa a tierra (IT), limite la tensión de entrada a la fuente de alimentación de la forma siguiente:

  - Para fuentes de alimentación con número de referencia de 81542300 a 81542302 ó 72896500 a 72896503, limite la entrada a 230 voltios alterna.

  - Para otros números de referencia, limite la entrada a 240 voltios alterna.

- Si no utiliza una fuente de alimentación recomendada por Imprimis asegúrese que la fuente de alimentación cumple las especificaciones de este manual y está diseñada para ser usada de acuerdo con las normas IEC380, IEC435, VDE805 y VDE806.

REQUISITOS DE INSTALACION

El local de la instalación debe cumplir las especificaciones dadas en las siguientes tablas y cifras.

TABLA C-1. REQUISITOS AMBIENTALES

TEMPERATURA	RANGO	VARIACION MAXIMO
Sin operar (desempaquetada)	-10 a 50º C	15º C por hora
Almacenada (embalada)	-40 a 60º C	20º C por hora
Operando	15 a 45º C	10º C por hora
HUMEDAD RELATIVA		
Sin operar (desempaquetada)	10% a 90% (sin condensación)	
Almacenada (embalada)	5% a 95% (sin condensación)	
Operando	20% a 80% con 10% de variación por hora (sin condensación)	
PRESION BAROMETRICA	-300 m a 3.000 m ó 105 Kpa a 69 Kpa	

TABLA C-2. REQUISITOS DE ENERGIA

ESPECIFICACIONES	VALORES	
	Unidad de 100/120	Unidad de 208/240
Margen de tensión	87 a 128 V	179 a 256 V
Frecuencia nominal	50/60 Hz	50/60 Hz
Margen de frecuencia	48 a 62 Hz	48 a 62 Hz
Fases	Monofásico	Monofásico
Consumo de potencia*		
Fuente integrada	0,237 kW	0,241 kW
Fuente remota	0,244 kW	0,236 kW
Consumo de corriente*		
Fuente integrada	3,5 A	2,1 A
Fuente remota	2,8 A	1,6 A
Factor de potencia		
Fuente integrada	0,68	0,56
Fuente remota	0,73	0,69
Corriente de arranque	Vea la figura C-1	Vea la figura C-1

* Medidas cuando los discos están girando y el actuador moviendose.

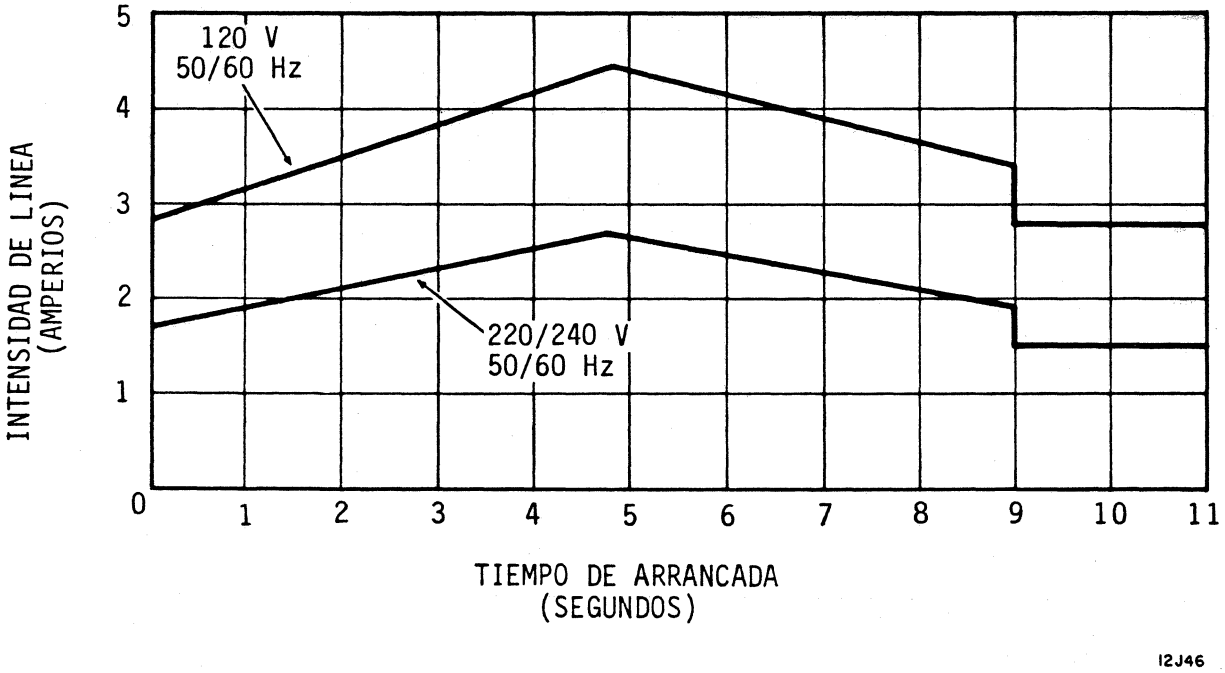


Figura C-1. Intensidad de linea y tiempos de arrancada.

INSTRUCCIONES DE OPERACION

PROCEDIMIENTO DE ENCENDIDO

1. Fijar a "ON" el interruptor "On/Standby" de la fuente de alimentación (CB1 en algunas unidades).

2. Asegúrese de que un disco de datos está instalado y la puerta frontal está cerrada.

3. Pulse el interruptor "START" para engranarlo en la posición de encendido.

   - Si el interruptor "LOCAL/REMOTE" ha sido fijado a LOCAL durante la instalación, la secuencia de encendido comienza inmediatamente.

   - Si el interruptor "LOCAL/REMOTE" ha sido fijado a REMOTE durante la instalación, la secuencia se retrasa hasta que la unidad recibe la adecuada señal desde el controlador.

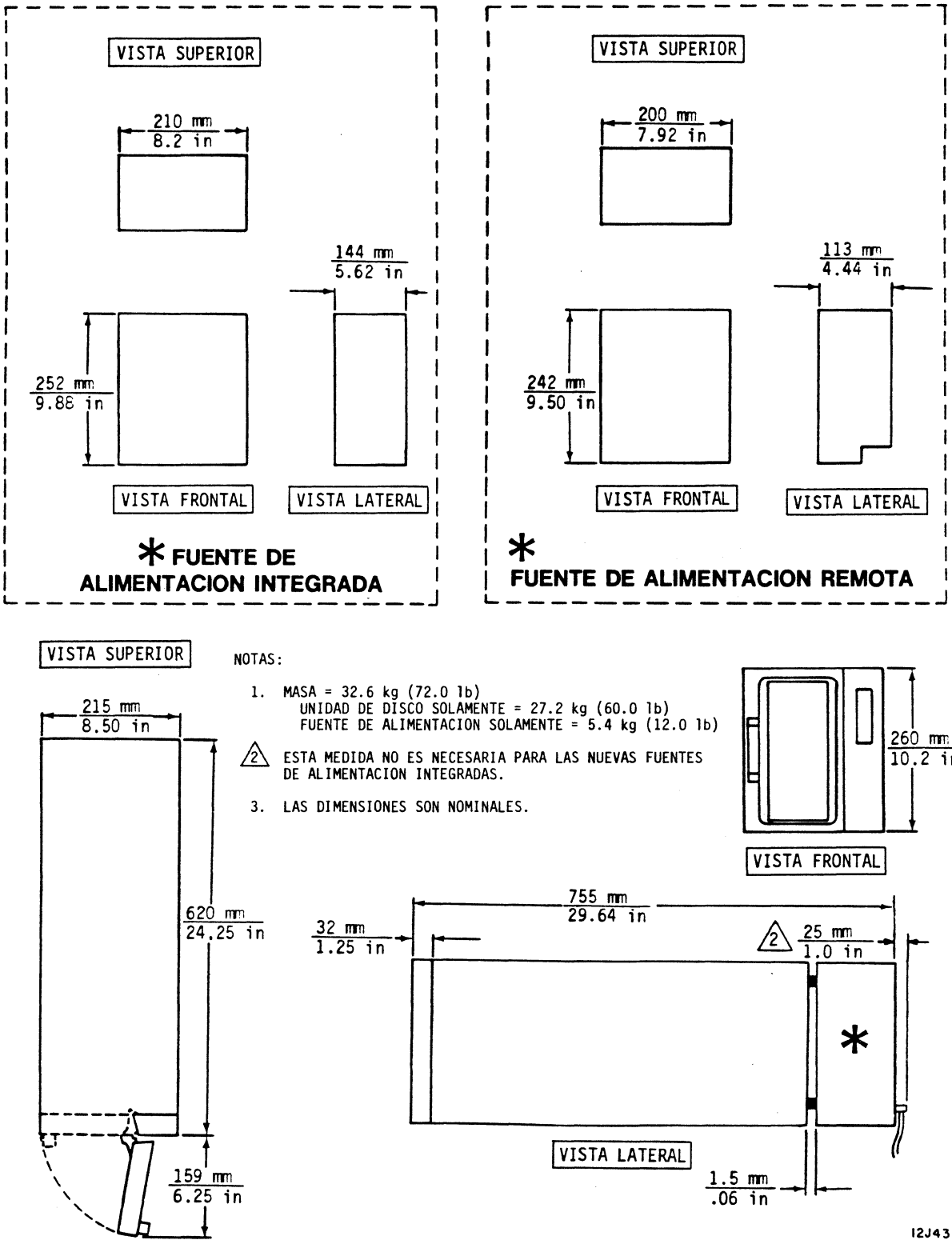


Figura C-2. Dimensiones y peso de la unidad de disco

4. Observe que el indicador "READY" (localizado en el interruptor "START") parpadea, indicando que la secuencia de encendido está en marcha.

5. Observe que el indicador de "READY" se enciende fijamente dentro de 60 segundos indicando que los discos están a la velocidad adecuada y las cabezas están cargadas.

6. Observe que el indicador "FAULT" ha permanecido apagado indicando que no han ocurrido erores y la unidad está disponible para leer ó escribir datos.

PROCEDIMIENTO DE APAGADO

1. Pulse el interruptor "START" para liberarlo de la posición de encendido. Si el interruptor "LOCAL/REMOTE" fue fijado en REMOTE durante la instalación, el controlador puede ordenar a la unidad que inicie la secuencia de apagado (en ese caso no es necesario pulsar el interruptor "START").

2. Observe que el indicador "READY" (localizado en el interruptor "START") parpadea para indicar que la secuencia de apagado está en marcha.

3. Observe que el indicador "READY" se apaga 35 segundos aproximadamente despues indicando que la secuencia de apagado ha finalizado. Las cabezas están descargadas y los discos no giran.

4. Retire la corriente continua de la unidad fijando el interruptor "On/Standby" de la fuente de alimentación a la posición STANDBY (disyuntor CB1 a la posición OFF).

COMMENT SHEET

Manual Title:

Publication No: ***Revision:***

Name: _____

Company: _____

Street Address: _____

City: _____ ***State:*** _____ ***Zip Code:*** _____

This form is not intended to be used as an order blank. Imprimis Technology Incorporated welcomes your evaluation of this manual. Please indicate any errors, suggested additions or deletions, or general comments below (please include page number references)

☐ *Please reply* ☐ *No reply necessary*

Cut along line

Printed in U.S.A.

KØR 0502F

No postage stamp necessary if mailed in U.S.A.

Fold on dotted lines and tape. Postal regulations prohibit the use of staples.

FOLD

FOLD

FIRST CLASS
PERMIT NO. 8241

MINNEAPOLIS, MINN.

BUSINESS REPLY MAIL

NO POSTAGE STAMP NECESSARY IF MAILED IN U. S. A.

POSTAGE WILL BE PAID BY

IMPRIMIS TECHNOLOGY INCORPORATED
TECHNICAL PUBLICATIONS DEPARTMENT
5950 CLEARWATER DRIVE
MINNETONKA, MN. 55343

CUT ALONG LINE

FOLD

FOLD

IMPRIMIS

A Subsidiary of Control Data

Sales offices located in major cities throughout the world.

Imprimis Technology Incorporated
12501 Whitewater Drive
Minnetonka, Minnesota 55343

LITHO